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Number 5.

AUGUST, 1904.

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TEXTILE WORLD RECORD

LORD & NAGLE COMPANY · Boston & Philadelphia

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The Annual Official Directory of the Textile Industries for 1904 is now ready for prompt delivery.

The Textile-Finishing Machinery Co.

17 EXCHANGE PLACE, PROVIDENCE, R. I.

Mercerizing Machinery for Piece Goods and Yarn in the warp or chain

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

Chemic and Sour

Rusden Patent

Continuous Chainless

Steamer,

Aniline Agers,

Dyeing Machines,

Open Soapers,

Blanket Washers,

Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING

DYEING

DRYING

AND

FINISHING

Calenders for Rolling, Glazing, Chasing and Embossing, also Calenders for Moire Finish.

Patent Combination Rolls made of Cotton and Husk especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

Hydraulic Presses and Pumps.

ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

Estimates, drawings and full particulars of complete plants furnished on application

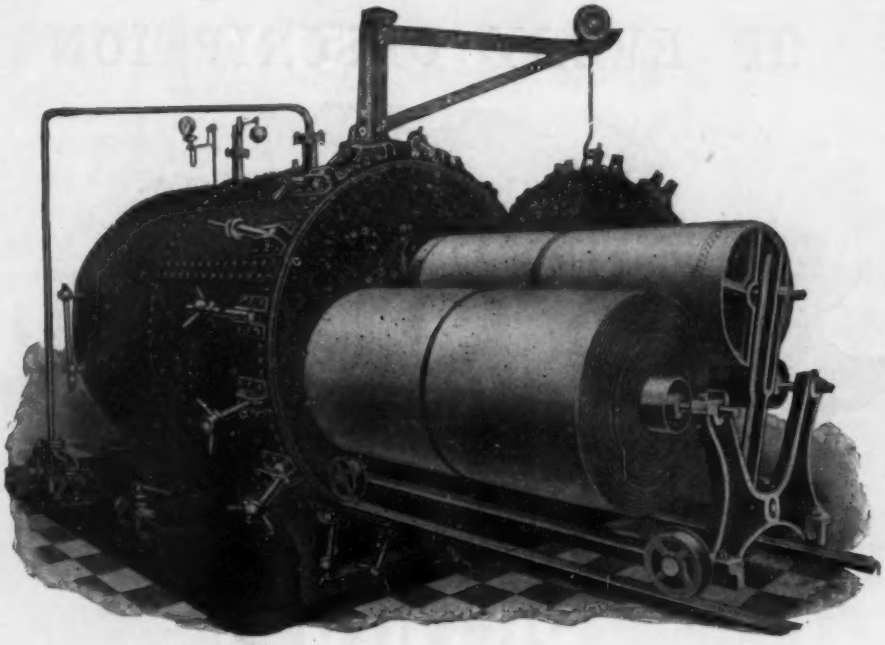
Southern Agent, STUART W. CRAMER, Trust Bldg., Charlotte, N. C., Equitable Bldg., Atlanta, Ga.

Open Bleaching System

OF

JACKSON & HUNT

Patented in the United States, Great Britain and the Continent
U. S. Patent, January 15th, 1901. No. 666,056



H. W. Butterworth & Sons Co.

Manufacturers of

Bleaching, Dyeing, Drying and Finishing Machinery

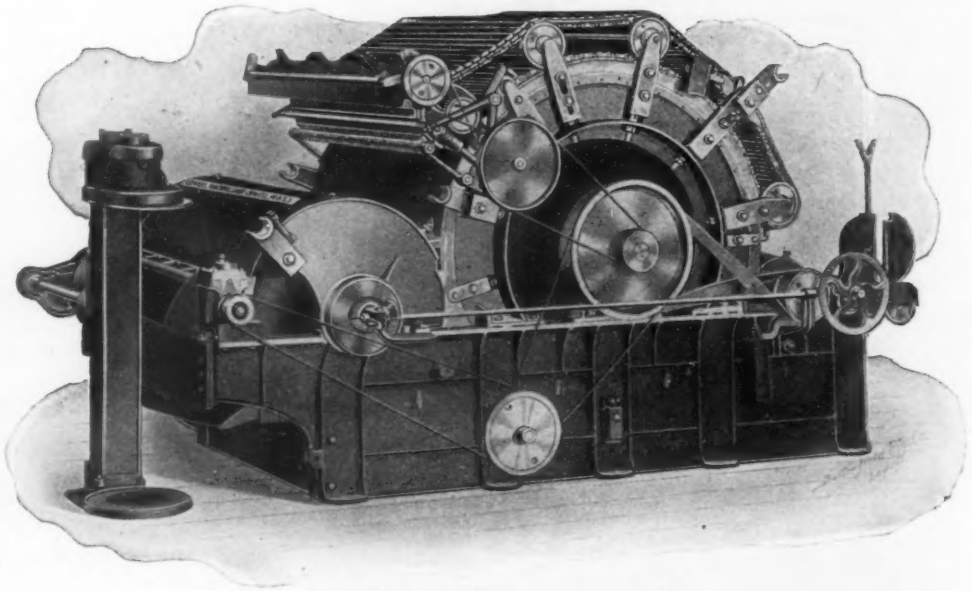
YORK AND CEDAR STREETS

PHILADELPHIA

Sole Makers for the United States

Cotton and Worsted Machinery

OF EVERY DESCRIPTION



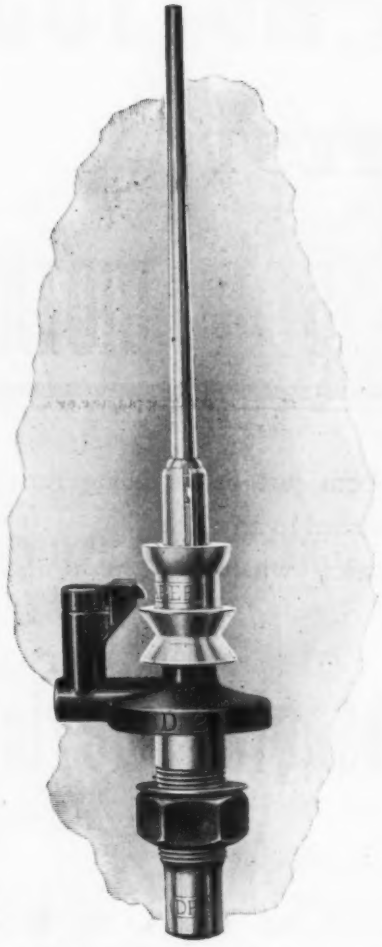
Revolving Flat Top Card.

Simple in Design and Construction. Durable in Operation. Maximum Carding with Minimum Waste. Improvements are added only after several years' trial, thus saving our customers and ourselves many annoyances which others have experienced. Workmanship a Leading Characteristic.

Lowell Machine Shop

LOWELL, MASS.

A New Spindle Improvement



The Rabbeth Centrifugal Bobbin Clutch.

Fits the Bobbin loosely when at rest—allows considerable variation in fit.

Bobbins will all go down into place and Traverse can be lengthened.

Allows easier and quicker doffing — stronger bobbins — less reaming.

Draper Company, Hopedale, Mass.

We Also Build Looms.

OUR LATEST!

AUTOMATIC FILLING STOP MOTION

This attachment will positively stop the loom just before filling runs out, leaving absolutely no mispicks, and it can be attached to any loom.

It can be seen in operation at our works, where we have also on exhibition our

Automatic Shuttle Changing Device.

THE ASALA COMPANY.

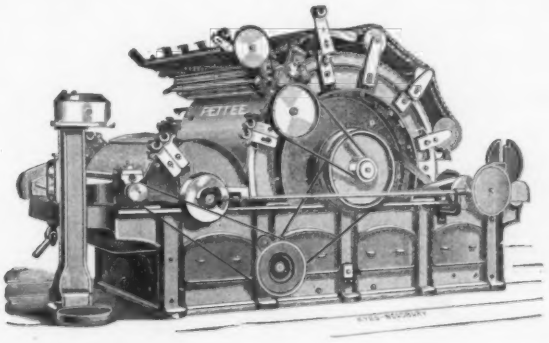
Works:
Slatington, Pa.

New York Office:
415 Broadway.

Saco and Pettee Machine Shops

NEWTON UPPER FALLS, MASS., U. S. A.

COTTON MACHINERY



PICKERS,
REVOLVING FLAT CARDS,
DRAWING FRAMES,
RAILWAY HEADS,

SLUBBING,
INTERMEDIATE AND ROVING FRAMES,
SPINNING FRAMES,

SPOOLERS AND REELS.

Shops: { **Biddeford, Me.**
Newton Upper Falls, Mass.

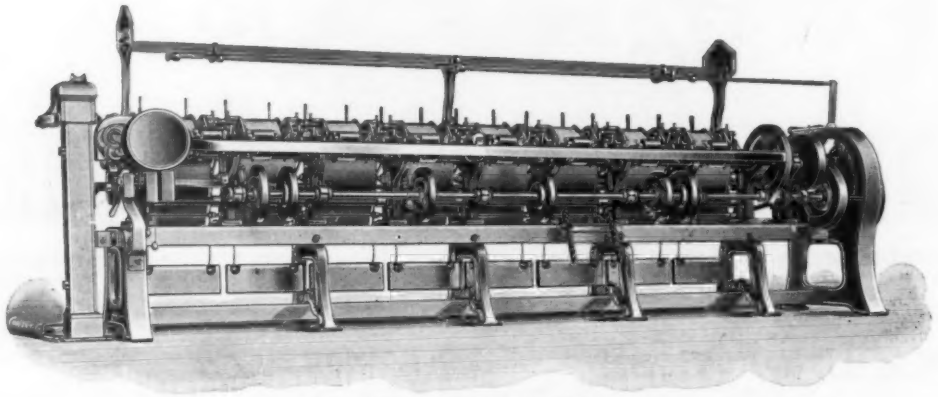
Southern Agent, A. H. WASHBURN, Charlotte, N. C.

THE

WHITIN MACHINE WORKS,

Cotton Machinery

WHITINSVILLE, MASS.



The Whitin 8 Head Comber.

Southern Agent, . . . S. W. CRAMER

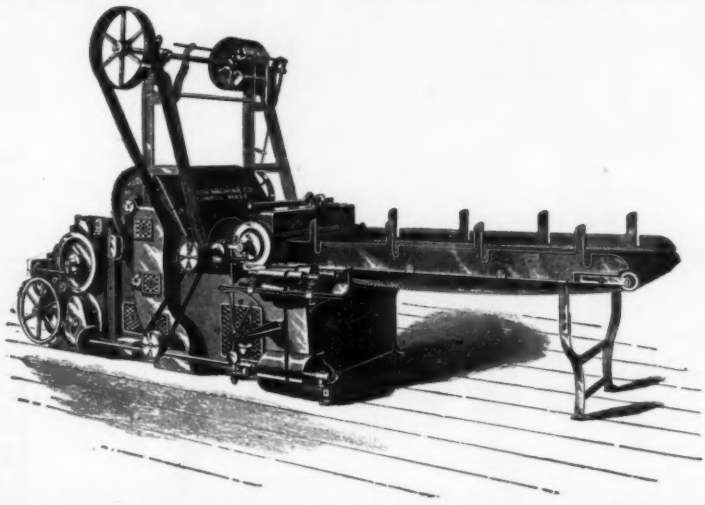
Trust Building, CHARLOTTE, N. C.
and Equitable Bldg, ATLANTA, GA.

Revolving Flat Carding Engines,
Sliver Lap Machines,
Ribbon Lap Machines,
Combers,
Railway Heads,
Drawing Frames,

Spinning Frames,
Spoolers,
Twisters,
Reels,
Looms,
Long Chain Quilling Machines.

The Best Pickers

In the Cotton Field nothing equals the DARKY COTTON PICKERS.



In the Cotton Mill nothing equals the KITSON COTTON PICKERS.

KITSON MACHINE CO., LOWELL, MASS.

LARGEST BUILDERS OF COTTON OPENERS AND LAPPERS IN THE WORLD.

STUART W. CRAMER, Southern Agt., Charlotte, N. C. and Equitable Bldg., Atlanta, Ga.

SCOTT & WILLIAMS

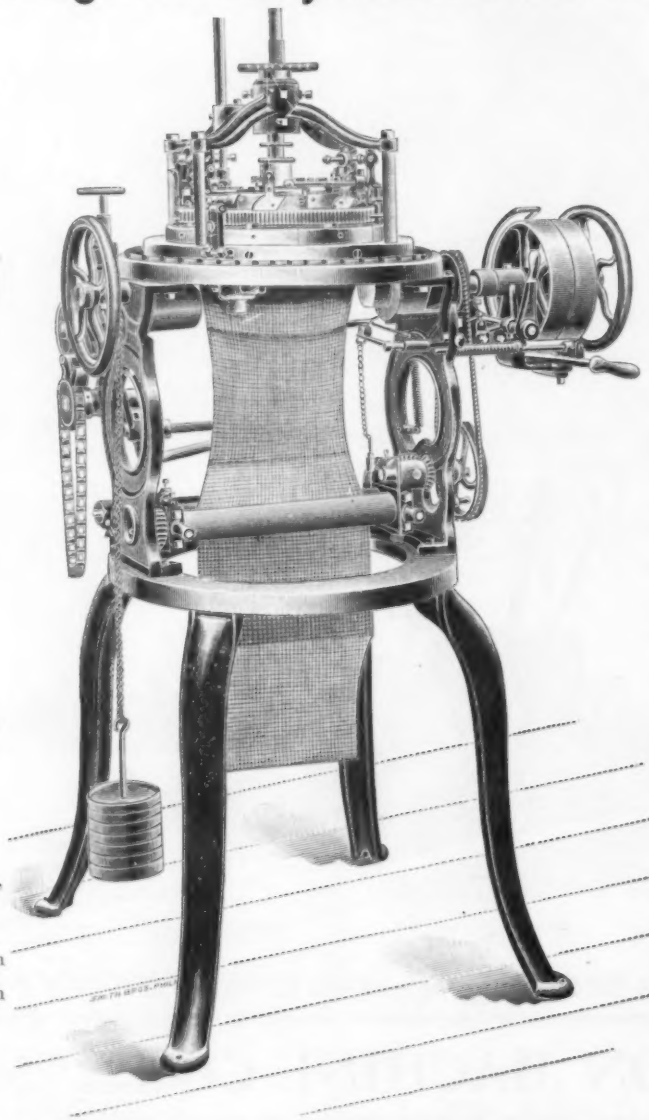
BUILDERS OF

Rib Knitting Machinery for Underwear and Hosiery

The illustration shows our

Improved High Speed Single Lever Automatic Ribbed Underwear Machine

for making ladies' and gents' ribbed underwear, union suits, etc., plain and shaped.



Plain, Single Lever or with Welt, Slack Course and Automatic Slackening Device for Welt.

Improved Measuring Device, by actual length knit.

Sizes, 8 to 24 inches, inclusive, varying by one inch.

Number of Feeds, four to 12, according to style and diameter of machine.

Solid Forged Steel Cylinders, specially hardened or with patent inserted walls for fine fabric.

Special Machinery for Sweaters etc.

We build Loopers, Ribbers and other Machinery for Knitting Mills

As well as

A Complete Line of Full Antomatic and 7-8 Automatic Seamless Hosiery Machinery.

Full Particulars, Samples and Special Catalogues on Application.

2079 E. Cumberland Street, Philadelphia, Pa., U. S. A.

BRANSON MACHINE CO.

BUILDERS OF

KNITTING MACHINERY

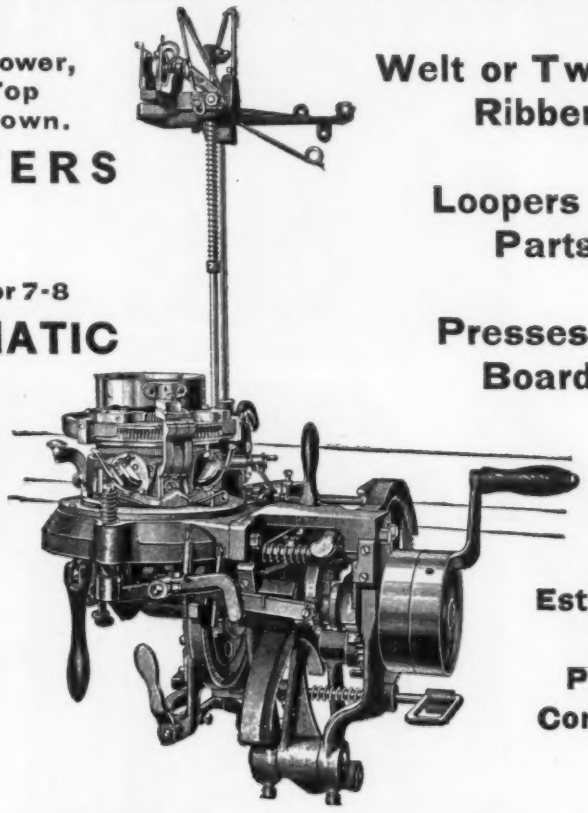
Hand or Power, Open Top or Hold Down.

KNITTERS

1-2, 3-4 or 7-8

AUTOMATIC KNIT-TERS

All Sizes and All Cauges.



Welt or Two-Feed Ribbers.

Loopers and Parts.

Presses and Boards.

Estimates for Plants Complete.

Winders and Bobbins. Hand Forged Steel Cylinders.

BRANSON MACHINE CO.

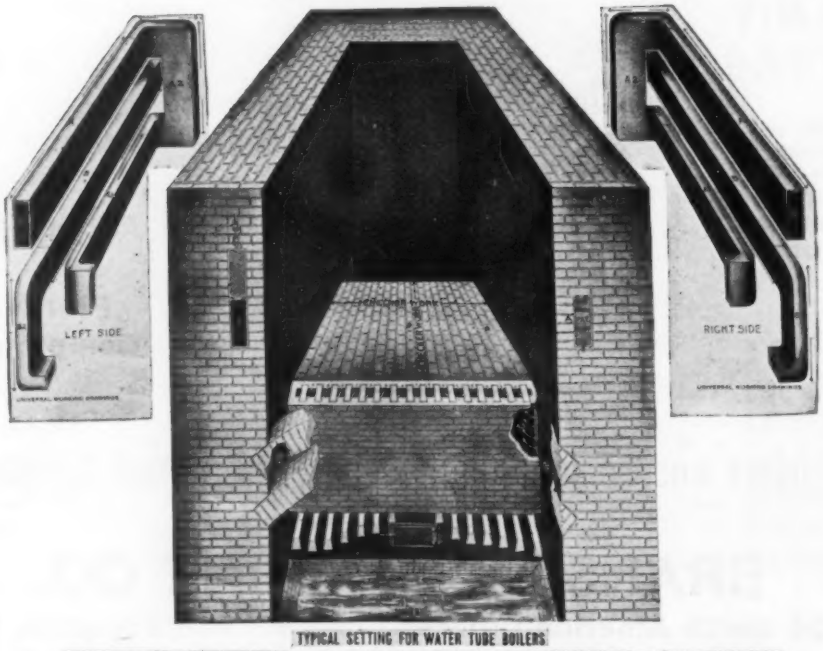
504 North American Street, : : Philadelphia, Pa.

Write for Information and Catalogue.

The Smoke Nuisance and the Profligate Waste of Fuel is Settled for all time

By the invention and practical operation of the DR. J. B. HARRIS SYSTEM. Absolute combustion of soft coal in steam boiler furnaces. NO SMOKE. Cheap and efficient. Harris' smoke Consuming Furnaces last as long as the boiler. 35 per cent. to 50 per cent. cheaper. By actual test evaporates 33 1-3 to 40 per cent. more water per pound of combustible. Burns any kind of fuel without smoke. Burns crude oil without smoke or odor. Pays for itself in six months. Patented March 22, 1904.

TYPICAL SETTING FOR RETURN FLUE TUBULAR BOILERS



TYPICAL SETTING FOR WATER TUBE BOILERS

Heine, Franklin, Geary, and with modifications in floor of Combustion Chamber suited to Babcock & Wilcox, Zell, Root, Stirling, etc.

Write for catalogue. County and State rights for sale, with or without royalty.

J. B. HARRIS, M. D., Patentee and Sole Owner, **71 Arcade, Nashville, Tenn.**

EVAN ARTHUR LEIGH

232 Summer Street (opposite the South Station), Boston, Mass.

SOLE AGENT IN THE UNITED STATES AND CANADA FOR

Platt Bros. & Co., Ltd.

BY FAR THE LARGEST MAKERS IN THE WORLD OF

Cotton, Woolen and Worsted Machinery

Platt Bros. & Co. are exhibiting in the Varied Industries Building, Louisiana Purchase Exhibition, St. Louis, Mo., the most complete line of Cotton Machinery that has yet been exhibited, for spinning from coarse counts up to 300's.

MATHER & PLATT, LTD.

Dyeing and Finishing Machinery. Archbutt-Deeley System for purifying and softening water.

TEXTILE MACHINERY ASSOCIATION, LTD.

Flax, Hemp and Jute Machinery.

THE PATENT AUTOMATIC FEEDING MACH. CO., LTD.

Patent Feeding Machines for wool, cotton, flax, fur and fibrous material.

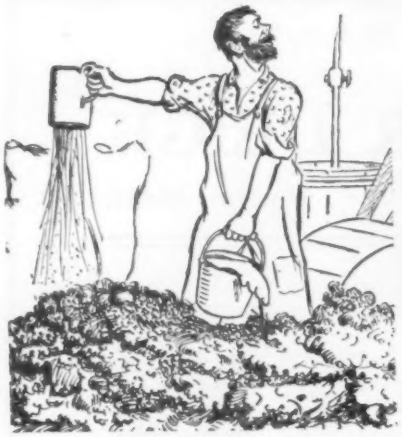
GEORGE HODGSON, LTD.

Looms for Worsteds, etc.

JOSEPH SYKES BROS., Card Clothing for Cotton.

JAMES CRITCHLEY & SON'S, Card Clothing for Woolen and Worsted.

DRONSFIELD BROS'. Grinding Machinery and Emery Filleting.
The best French and English Combing and Rubbing Aprons.
Harding's Pins and Circles, Varey's Fallers, etc.



What Changes!

THE OLD WAY.

Oiling stock with a tin can with holes punched in the bottom, or a watering pot. Wasteful of oil and labor and seldom done twice alike, but is still used in some mills.

THE MODERN WAY.

Oiling and dampening stock with the Spencer Automatic Oiler applied to feed table of wool picker, lumper or lapper. Batches treated as desired. Perfect regulation.

Not much need to dwell upon the advantages of the automatic system, by which uniform results are obtained with saving of oil and labor, as compared with the sloppy, guess work, waterpot system.

It's the story of the Bramwell and Apperly feeders over again. How many mills are feeding by hand to-day? There will be very few oiling by hand in a few years. Hundreds of the best mills are using the Spencer Oiler to-day. Are you? If not, send for particulars.

GEORGE S. HARWOOD & SON, 53 State St., Boston.

HENDERSON'S

Double Carding Process for Wool

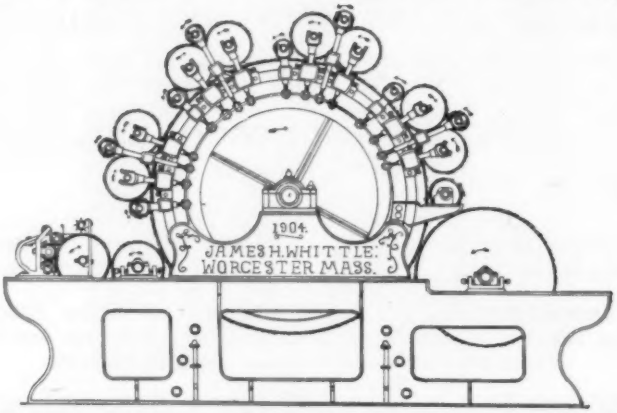
(Patented May 10, 1904)

Is a Great Success.

Manufactured By **JAMES H. WHITTLE,** 150 Harlow St., Worcester, Mass.

INCREASES PRODUCTION AND QUALITY

SAVES LABOR



SAVES ROOM

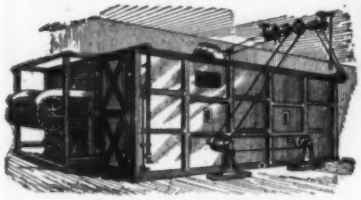
APPLIED TO EITHER OLD CARDS OR NEW

WOOL AND WORSTED MACHINERY

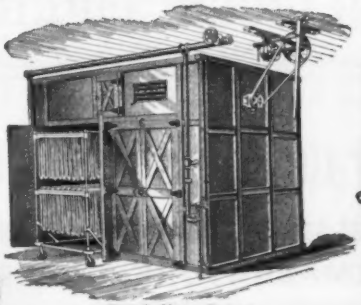
Including Carding Machinery for Wool and Worsted, Yarn Twisters, with or without Novelty Attachments, Yarn Dressers, Reels, Beamers, Single or Double. Yarn Spoolers, Dresser Creels, Cloth Dryers, of all widths, New Rotating Skein Dryers, Four and Eight Drum Spoolers, Improved Hydro Extractors, Improved Dusters with Fan, New Pattern Mixing Picker, Skein Drying Reels, etc.

"HURRICANE" DRYERS AND FANS

For WOOL, COTTON STOCK, YARN, STOCKINGS, UNDERWEAR, Etc.



Cotton Stock and Wool Dryer.



Truck Yarn Dryer.

MACHINERY FOR **BLEACHING** AND **CARBONIZING.**

Write for Booklets.

"Hurricane" Fan, Style No. 2.

SPECIAL MACHINERY OF EVERY DESCRIPTION DESIGNED AND BUILT.

PHILADELPHIA DRYING MACHINERY CO.

6721 Germantown Ave., Philadelphia, Pa.

HOUGHTON'S ALL STEEL THREAD BOARD

with Hardened Thread Guides.

PRICE.

Steel Thread Boards, 7½ c. per Sp.
Brass " " 15 c. "
(f.o.b. Worces'er.)

Add 3 c. each for Metal Rail.

PATENTED.

Nov. 30, 1897. Nov. 9, 1901.
Mar. 8, 1898. June 9, 1903.
July 1, 1901. Mar. 1, 1904.
May 9, 1904.

and other patents pending.

Any infringements of the above Patents will pe prosecuted.

(Our Latest Model Hinge and Steel Rail.)

The only Thread Board that *holds a guide solid* all the time; *never* gets loose; is always in perfect adjustment, and thus must make a saving in travelers, broken ends, waste, thread guide, care and also prolong the wear of rings and increase the production per spindle. These claims are based on the truth of mechanical principles, and have been proven true by actual use in many mills whose superintendents will substantiate these claims. Write for list of mills using our Thread Boards.

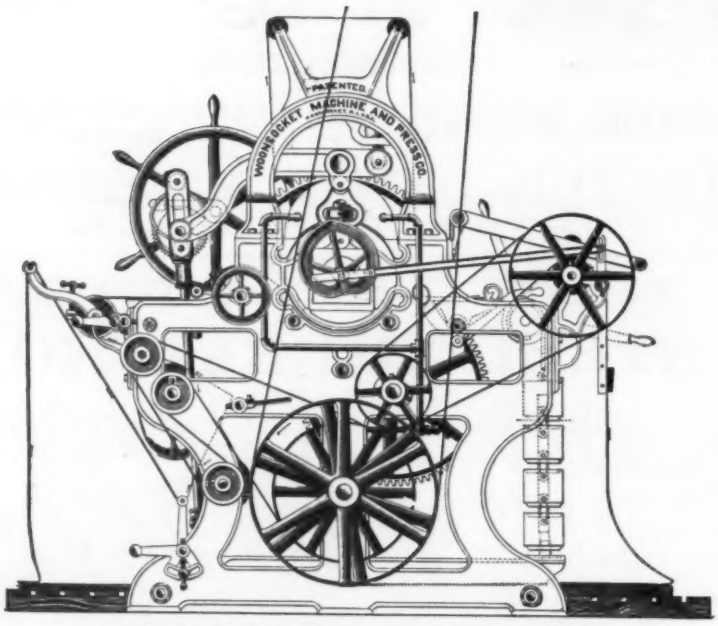
L. T. HOUGHTON, Sole Manufacturer, WORCESTER, MASS.

Best Patent Steam Rotary Cloth Press

Four Separate Pressings In One Machine!

The Only Press that has Self-Yielding Beds with Four Points of Contact

PERFECT TEMPERATURE, POWERFUL, SIMPLE



THE WOONSOCKET ROTARY PRESS.

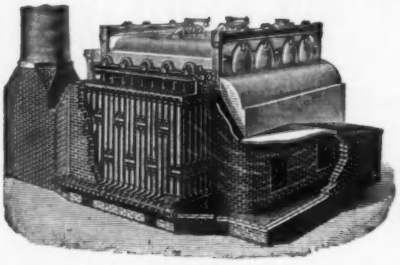
Woonsocket Machine and Press Company

WOONSOCKET, R. I,

In Supplying Boilers with Hot, Purified Water,

Thus keeping a larger heating surface, as well as meeting sudden demands for power, the

Green's Economizer



Is but beginning its Savings to Plant Owners.

What has been, and possibly will again be, cost of fuel—one of the greatest expenses of a plant, is reduced from 10 to 20%. Mills, Bleacheries and Dye Works having a *Green's Economizer* realize the greatest saving. We will be pleased to send our free booklet showing construction and how applied.

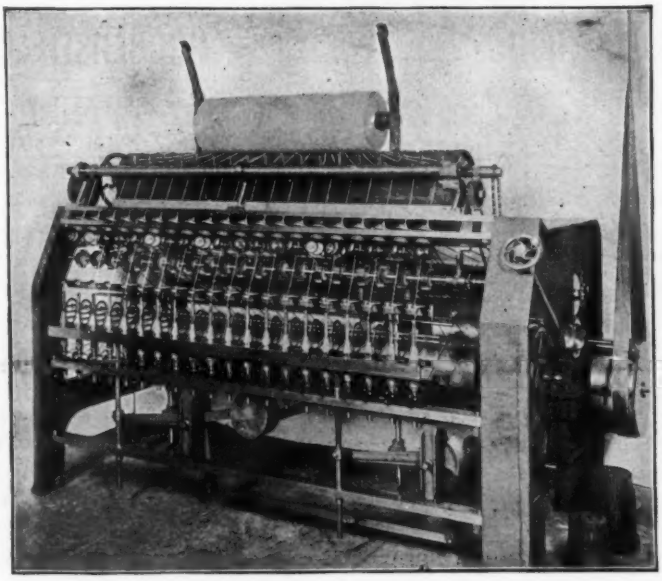
The Green Fuel Economizer Co.,

Sole Manufacturers in the U. S. A. **MATTEAWAN, N. Y.**

A NEW WOOL SPINNING FRAME

On Exhibition at the Bourse, Philadelphia.

Patented in Europe and America.



Adapted to Spinning Mixed Fibres of any Description.

ADDRESS ALL COMMUNICATIONS FOR THE PRESENT TO

C. L. FLACCUS, 224 NO. THIRD ST., PHILADELPHIA, PA.

THE

A. T. ATHERTON MACHINE CO.

PAWTUCKET, R. I.

The Leading Manufacturers of

PREPARATORY COTTON MACHINERY

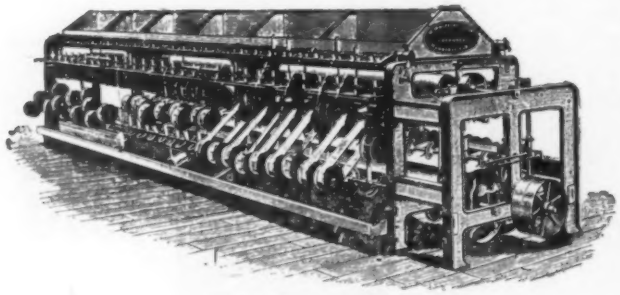
Telegraphic Address: "WHITELEY, HUDDERSFIELD." Nat. Telephone, 598 and 599.

Wm Whiteley & Sons Ltd

LOCKWOOD, HUDDERSFIELD.

MANUFACTURERS OF

Woolen Machinery.



CONE PIRN WINDER.

Makers of all descriptions of

Tentering and Drying Machines.

Moore & Whiteley's Patent Wool and Cotton Dryer.

Crabbing or Winding-on Frames.

Cross Raising Machines, Wool Scouring Machines.

Hydro Extractors. Warp Sizing.

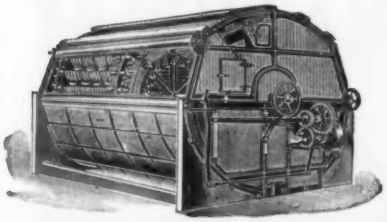
Cool Air Drying and Beaming Machines.

Warping Mills with Patent Sectional Dividing Apparatus.

Self-Acting Mules. Bobbin or Pirn Winder, &c., &c.

Mercerizing Machinery.

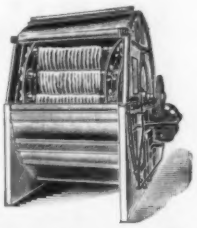
SKEIN AND SLUBBING MACHINES



SAVES

75% in Labor.
30% in Winding.
Steam and Dye Stuffs.
No Friction.
No Tangling.

CAPACITY
50 to 700 lbs per batch.



THE KLAUDER-WELDON DYEING MACHINE CO.

AMSTERDAM, N. Y.

Builders of Machines

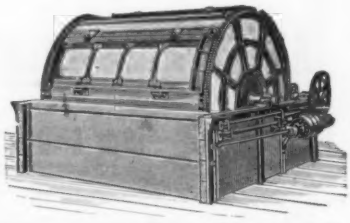
For Skein—Worsted, Slubbing, Cotton and Silk.
" " and Warp Mercerizing.
" Raw Stock Cotton, Wool, Waste and Rags.
" Garments Underwear, Hosiery and Caps
" Sulphur Colors—Raw Stock, Skein and Hosiery.

RAW WOOL AND COTTON MACHINES.

CAPACITY
200 to 1000 lbs per batch.

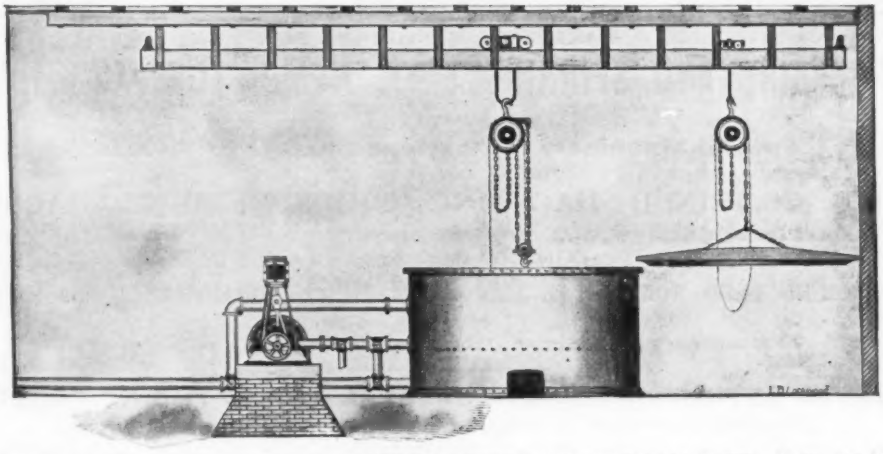
SAVES

50% in Labor besides Steam and Dye Stuffs. Practically indestructible. Leaves stock in perfect condition.



VACUUM DYEING MACHINE CO., CHATTANOOGA, TENN.

RAW STOCK, YARN AND HOSIERY DYEING MACHINES



OFFICE OF TREMONT & SUFFOLK MILLS, LOWELL, MASS., Jan. 14, 1904.

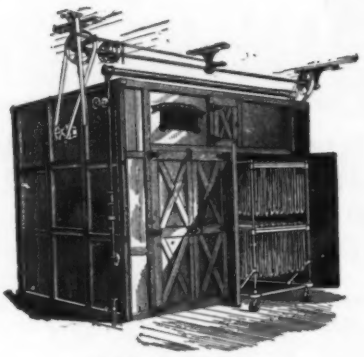
VACUUM DYEING MACHINE CO., Chattanooga, Tenn.

GENTLEMEN: Repiying to your inquiry in regard to what we think of your Raw Stock Dyeing Machine, would state that we have been using one about six months, with very satisfactory results, the dyeing being level, and the stock left in first-class condition for spinning. Can give your machine no better recommendation than to say, we think so well of it that we have just placed an order for two additional machines.

Yours truly J. J. CONNELL, Agent.

"20th CENTURY" MACHINERY

DRYERS
for
WOOL,
COTTON STOCK,
YARN, STOCKINGS,
UNDERWEAR.
VENTILATING FANS.
MACHINERY
for
CARBONIZING
and
YARN SCOURING.



TRUCK YARN DRYER.

CLOTH WASHERS
and
CLOTH DYEING MACHINES, BLEACHING MACHINERY FOR KNIT GOODS, ETC.
CONTINUOUS SYSTEM FOR BLEACHING COTTON STOCK.
TOM-TOMS,
CHROMING, WASHING
and
OXIDIZING MACHINES.

AMERICAN DRYING MACHINERY COMPANY,

19th AND WESTMORLAND STS., PHILADELPHIA, PA.

Fairbairn Lawson Combe Barbour, Ltd.

LAWSON BRANCH,

Hope Foundry. **LEEDS.** **England.**

MAKERS OF MACHINERY FOR

PREPARING AND SPINNING FLAX, HEMP, TOW AND JUTE

AND OF

Special Machinery for the Manufacture of Twines,

ALSO OF

GOOD'S COMBINED HACKLING AND SPREADING MACHINE,

LONG REACH SCREW-GILL DRAWING FRAMES,

CHAIN-GILL DRAWING FRAMES with Apron Head,

PATENT HIGH-SPEED HORIZONTAL AND AUTOMATIC SPINNING FRAMES FOR MANILLA,

AND OTHER

Special Machinery for the manufacture of Rope Yarns and Binder Twine.

IMPROVED LAYING MACHINES. HASKELL-DAWES TUBING TWISTERS

BROWNELL'S PATENT TWISTING AND LAYING MACHINES FOR TWINE.

Complete Plans and Estimates for Flax, Tow, Hemp and Jute Mills, Trawl Twine Factories and Steam Ropeworks.

Sent Anywhere on 30 days' trial

To prove that the

CROSS OIL FILTER

is the most perfect method of filtering and purifying lubricating oils, and also to prove that it WILL SAVE ONE-HALF THE COST OF OIL, we will send the filter anywhere on thirty days' trial.

"So far as we are aware, the Cross Oil Filters are the most satisfactory on the market."—St. Louis (Mo.) Portland Cement Co.

That Incessant Spraying

and dripping of water and oil from the exhaust pipe, which rots, rusts and does other damage to roofs and walls

Can be stopped by the Burt Exhaust Head.

It is the most perfect head made.

Sent anywhere on approval.

"The Burt Exhaust Heads have fully come up to our expectations. These expectations were very high."—Selma (Ala.) Water Co.

The BURT MFG. CO.

LARGEST MANUFACTURERS OF OIL FILTERS IN THE WORLD.

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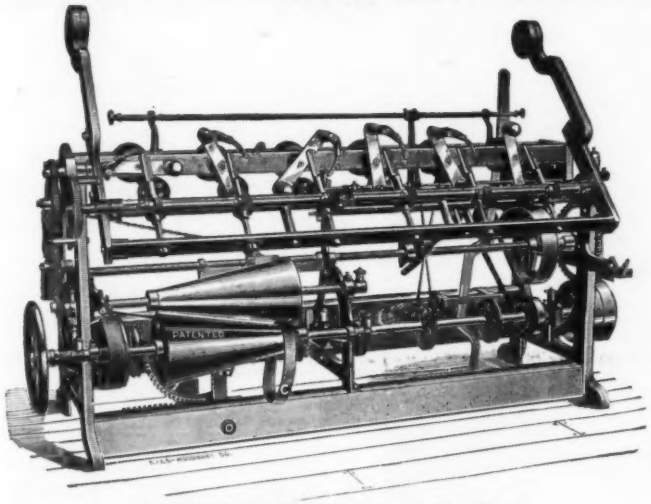
ALSO SUPPLIED BY OIL COMPANIES, ENGINE BUILDERS AND POWER CONTRACTORS.

NORTH CHELMSFORD MACH. CO.

Successors to SILVER & CAY CO.



AUTOMATIC BALL WINDER.

Adapted to All Kinds of Twines, Silks and Floss.

MANUFACTURERS OF

Automatic BALL WINDERS.

QUILLERS & REELS.

ALSO

SPECIAL MACHINERY

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DRAWINGS OR PATTERNS.

Repairing, Turning, and Refluting Worsted Spinning and Drawing Rolls a Specialty.

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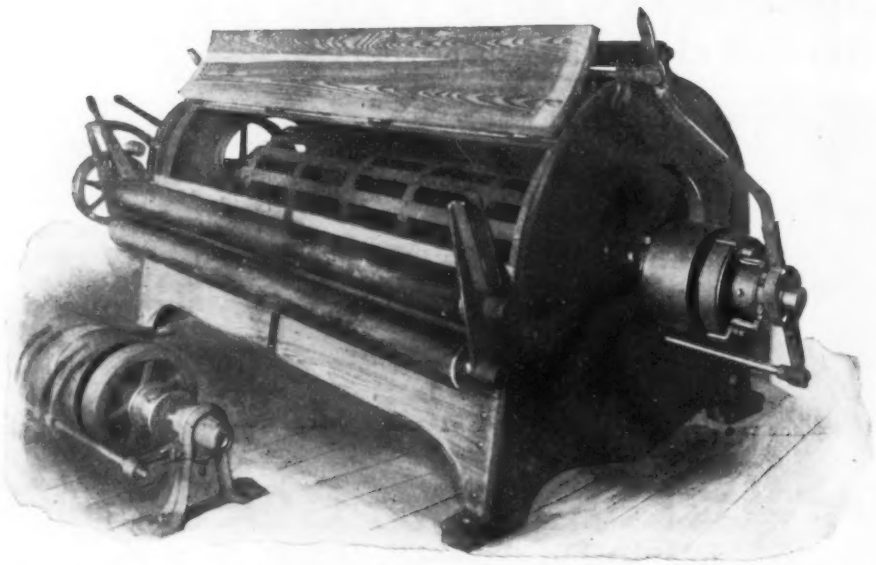
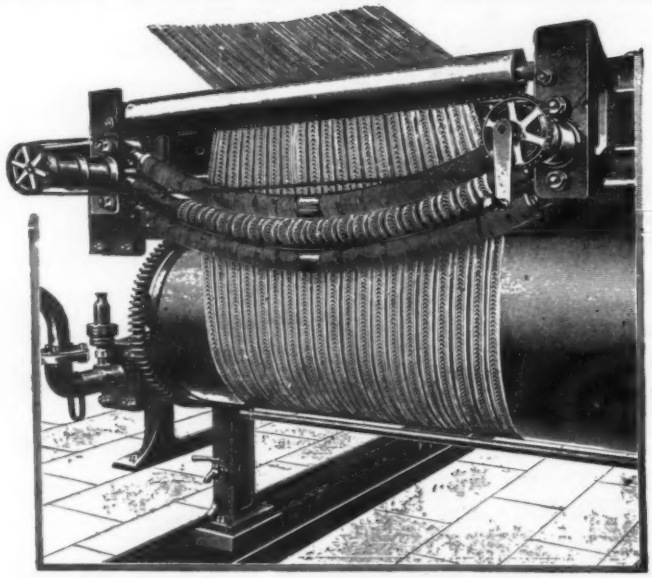
Eaton's Horizontal Cloth Extractor



This machine will extract the liquid from woven goods of thin or medium weight. Practical men will see at a glance its advantage over the ordinary hydro-extractor. It does not wrinkle or distort the goods or disturb the nap, and therefore especially valuable for face goods. It is built very heavy and strong, and can be run at high speed with less danger than with the ordinary extractor. The goods are run on to the drum at slow speed and properly secured, and then run at high speed, causing the water to be extracted. The cloth is then unwound slowly by a reverse motion. **Price reasonable.**

WYMAN EATON, Builder, Dolgeville, N. Y.

A PERFECT CLOTH EXPANDER



The recent invention of Wm. Mycock, an English cotton manufacturer. Hundreds sold in Great Britian and on the Continent. Large bleacheries in this country where it has been placed on trial are delighted with it. Gets the full width of goods, with perfectly even tension both ways. Can be attached to calenders or cans. Put it on trial.

Patented in United States, Canada, Great Britain and Continental countries. Infringements will be prosecuted.

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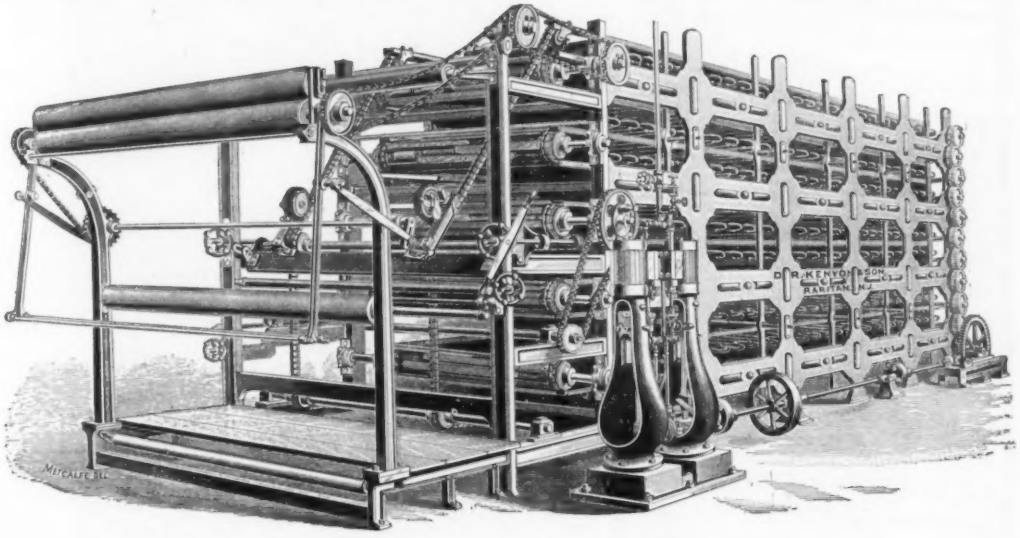
Sole Agents for the United States and Canada.

Tentering and Drying Machines

WITH LOW DOWN FEED. PATENTED FEBRUARY 26, 1895.

Tentering and Drying Machines on Pipe System. Special Dryers for Heavy Felt Goods. Hot Air Drying and Tentering Machines.



Fulling Mills, Washers, Chinchilla and Whitney Machines, Whipping Machines, Cone Willows, Marsden & Blamire Lap Feed, Dyeing Machines for Piece Goods, Soaping Machines, Wringing Machines, Jigs, (double or single,) Dewing Machines, etc.

MANUFACTURED BY

D. R. KENYON & SON,

SUCCESSORS TO KENYON BROS.

Long Distance Telephone, Somerville 40-B.

RARITAN, N. J.

RODNEY HUNT MACHINE COMPANY

WATER WHEELS,
Horizontal and Vertical.
Iron Flumes and Penstocks.
Rotary Fire Pumps.
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Head Gate Apparatus.
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and Washer for Knit Goods.
Endless Felt R'y Washers
and Rotary Felling Mills.
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Dolly Washers.
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Crank Knit Goods Washers.
Wringing and Rinsing Mchs.
Reel Dyeing Machines.
Carbonizing Machines.
Bleaching Machines for
Chloride of Lime and
Peroxide of Sodium,
Dye Tubs and Rinsers.
Wool Washers.
Soaping Machines.
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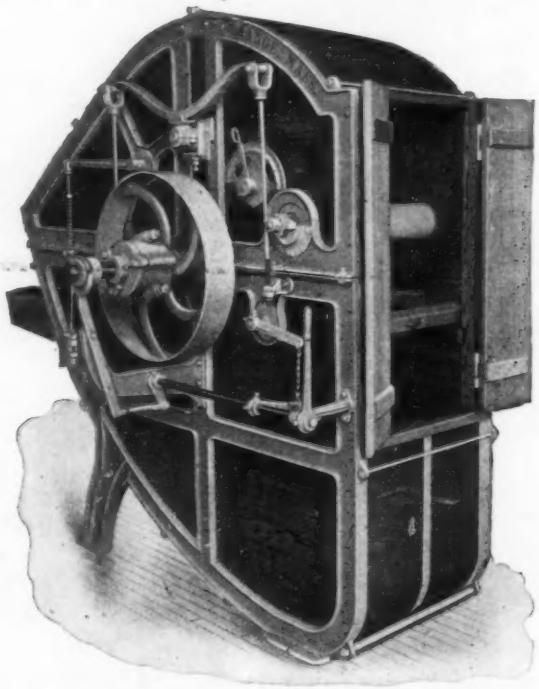

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Write for our Special Circulars with Large Illustrations and Full Description of Our Machines.

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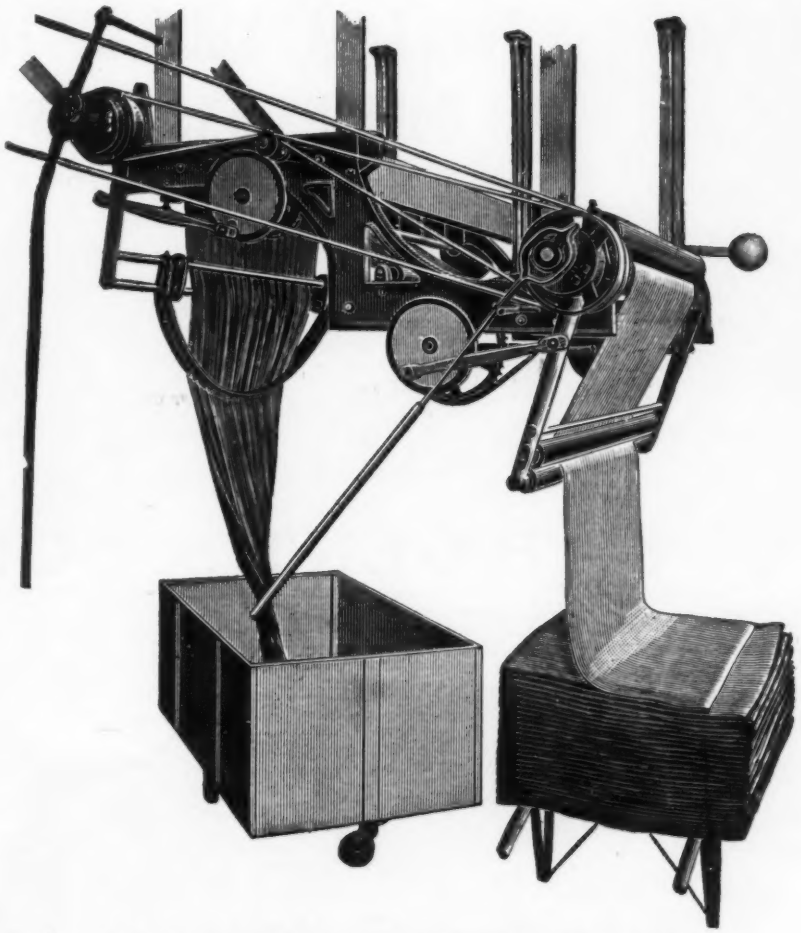
The Hunter CLOTH OPENER AND FOLDER



ONE MAN CAN OPEN AND FOLD MORE GOODS IN A DAY WITH THIS MACHINE THAN FOUR MEN CAN DO BY HAND.

No stretching or beating of goods under tension. All the parts coming in contact with cloth are brass or wood.

Opens any width of cloth from 63 inches down to 30 inches. Can be built wider for blankets.

James Hunter Machine Co., North Adams, Mass.

You Want the Best. We Build Them.

CLOTH WASHERS, FULLING MILLS,

1901 FULLING MILL.

Piece Dyeing Machines,
Dye Tubs, Vats,
Tanks, etc.

HOPKINS MACHINE WORKS

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Our Machines are up to date.
Patented features found in no others.
Most effective and economical machines built.

Send for Catalog, Prices, and also ask about our Fulling Mill for extra heavy goods and blankets.

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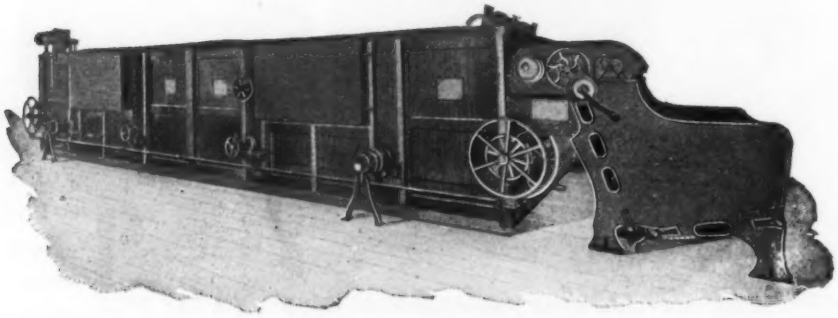

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Stock Dryers, Wool Washers,
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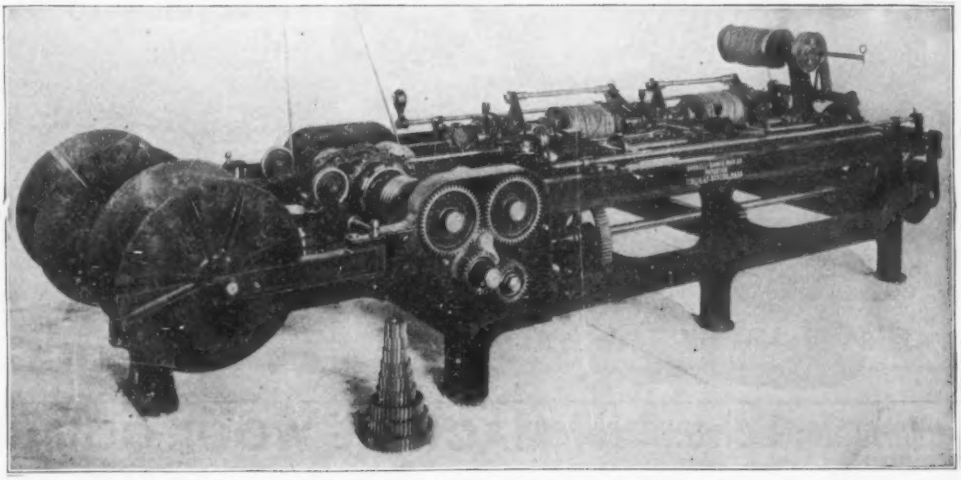
THE HASKELL-DAWES MACHINE CO.

Manufacturers of the best types of

Forming, Twisting and Laying Machinery

Which are adapted for making all kinds of

COTTON CABLE-LAID TWINE, CORD and ROPE



The Haskell-Dawes Machines are built upon a NEW PRINCIPLE, whereby the MOST POSITIVE RESULTS ARE SECURED. They occupy LESS SPACE than the ordinary type of machines, require LESS RELATIVE POWER, and will turn out a MUCH LARGER PRODUCT of Twine and Rope. The SPECIAL ATTENTION of Cotton Manufacturers is called to our new FORMING AND ROPE-LAYING MACHINES. Descriptive Catalogue Sent on Application.

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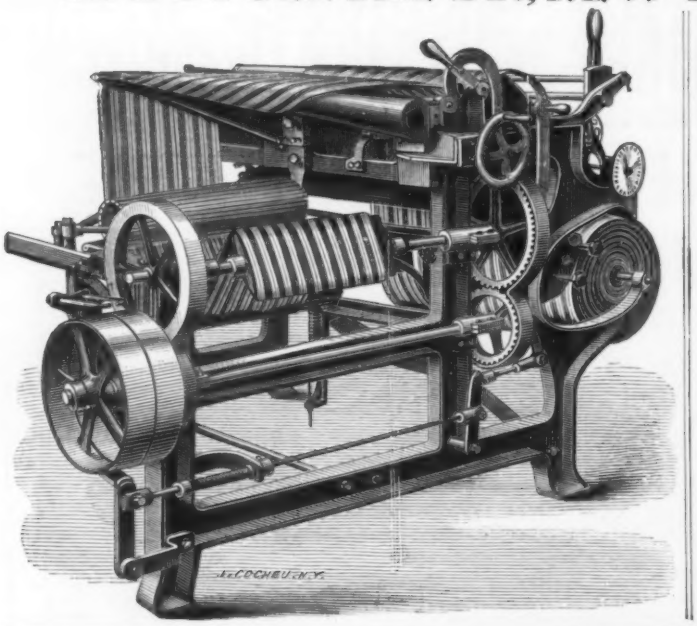

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On Cottons, Woolens and Carpets.

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and imprint the measurement upon fabrics, fold lengthwise and roll into merchantable packages all in one operation.

Prevents claims for short measure.
Marks piece numbers on each package.

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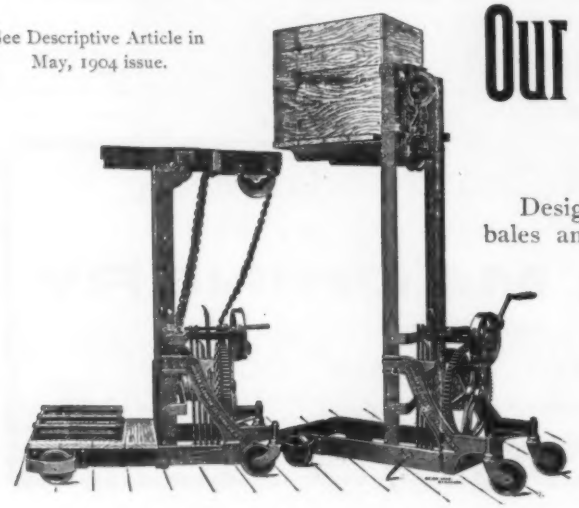
See Descriptive Article in May, 1904 issue.



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Is a great LABOR SAVER

Designed especially for piling cases, bales and heavy packages. One man can lift 800 lbs. with ease. In use in many representative mills. Write for illustrated circular giving list of users. We have received many gratifying letters from mills speaking of the entire satisfaction received.

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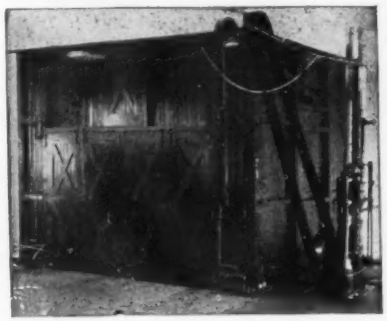
MACHINES



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ON THE
COLD AIR SYSTEM. Simple, effective, inexpensive. Leaves yarn in beautiful condition.
ALSO ON THE
HOT AIR SYSTEM when great capacity is wanted.

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Latest Model

Niederlahnstein Automatic
SKEIN MERCERIZING MACHINE
(Pat. "Hahn")

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Also the best mercerizing machine for **PIECE GOODS** and **KNIT GOODS** which has proved very successful.

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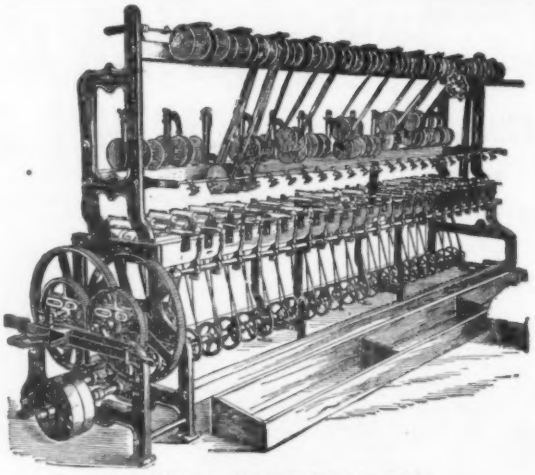
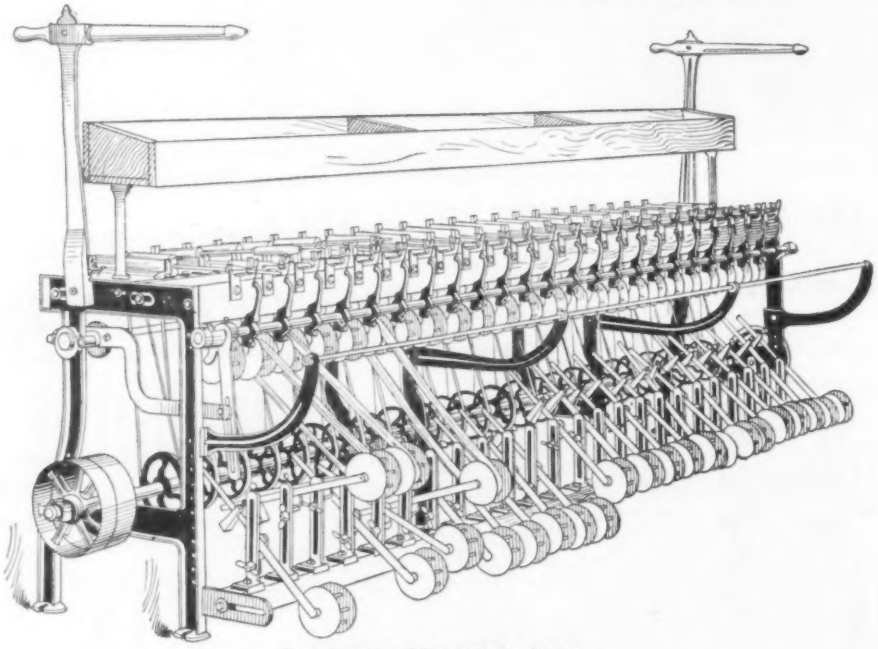


Patent Shuttle Bobbin Winder for Skeins, with Patent Variable Motion.



Patent Butt and Cop Winding Machine.

JACOB K. ALTEMUS,

2818 North 4th Street, PHILADELPHIA, PA.

FULL PARTICULARS ON APPLICATION.

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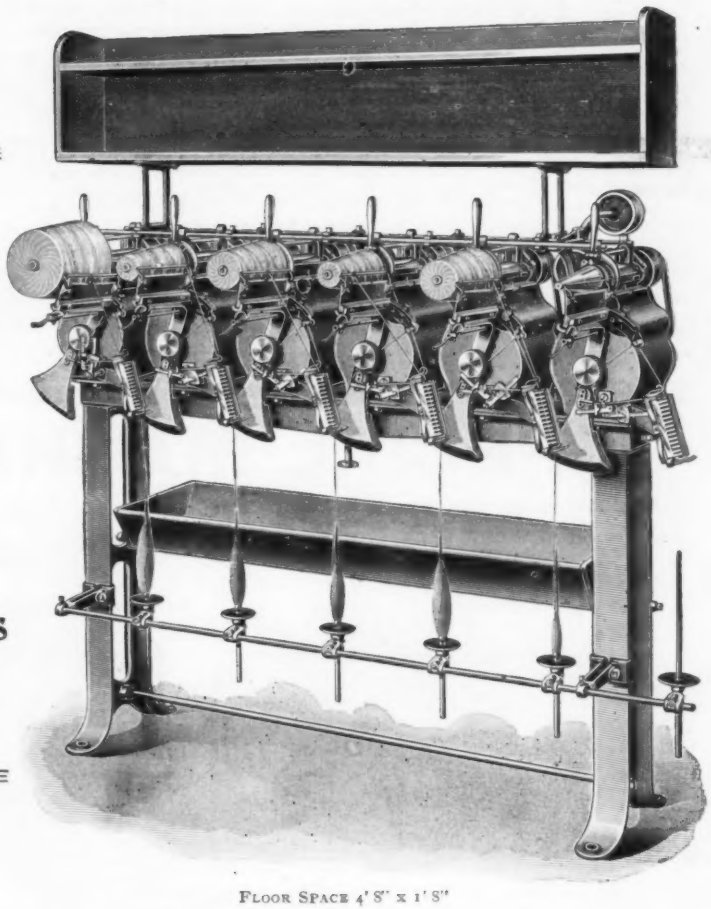
Our New
No. 50 Machines
Wind Cones
for
Knitting and
Double Fine Yarns
for
Twisting.



FLOOR SPACE 4' 8" x 1' 8"

They Combine { **Durability, Compactness, Simplicity, Economy.**

Fitted with such delicate tension devices that the finest yarns are wound without strain at high speed.

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SPECIAL MACHINERY,

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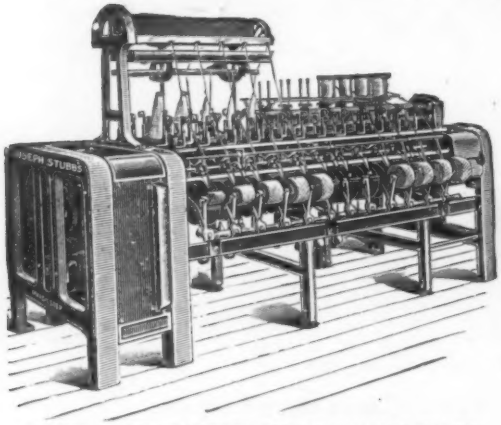
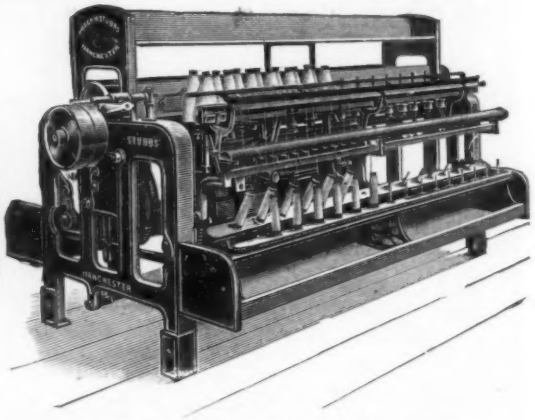


PATENT QUICK TRAVERSE COTTON GASSING FRAME.



IMPROVED RABBETH SPINDLE WINDER.
With Patent Tapering Motion, for Single Flanged Bobbins.

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Received the HIGHEST AWARD on recommendation of the FRANKLIN INSTITUTE for

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The Only Perfect System of Air Moistening

And Has Been Adopted by the Representative Manufacturers of this Country.

The only System adopted in the Textile Schools. Write for Booklet "T" on Humidification. Legal Proceedings will at once be taken against infringers and users of infringements.

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FOR COTTON, AND GINGHAM MILLS, BLEACHERIES, PRINT WORKS, ETC.

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SILK MILL SUPPLIES

OF EVERY KIND AND DESCRIPTION

Also Power Transmission Supplies for General Mill Use.

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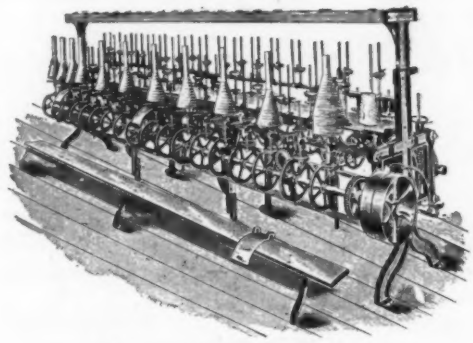

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Manufacturer of

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OF ALL DESCRIPTIONS.

Special Machinery Built to Order.

Write for Particulars.

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"The Perfect Solid Lubricant"

Dixon's Pure Flake Graphite

prevents shut-downs and saves oil, coal, repairs and trouble
Booklet 120C and sample upon request

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CARDER'S TOOLS

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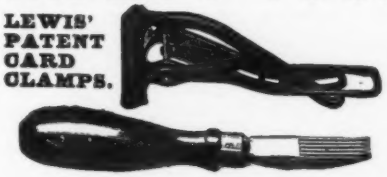

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For Setting Up Bent Teeth of Card Clothing with a variety of all other tools used by carders and Manufacturers.
Send for circular.

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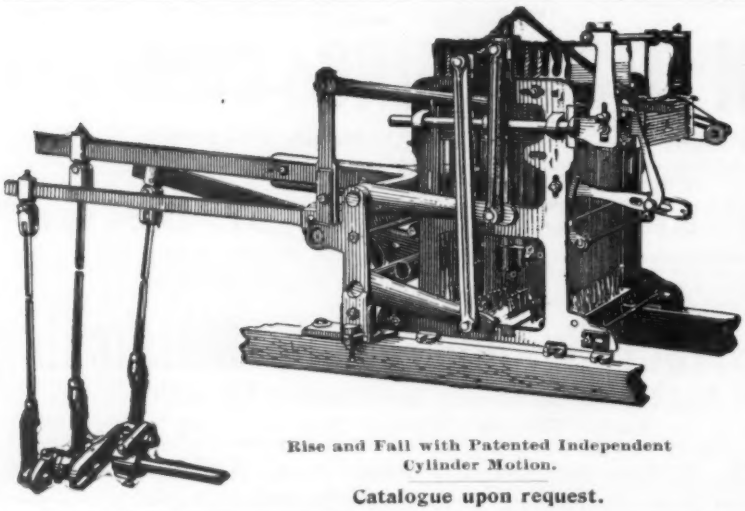

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Catalogue upon request.

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HALTON JACQUARD

"The Best Machine on the Market"

Original Fine Index Machines

Single Lift, Double Lift, Double Cylinder, Rise and Fall, Crossborder.

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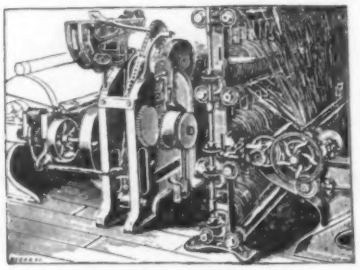

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HARRISON, N. J.

TORRANCE PATENT **AUTOMATIC BALLING MACHINE**

With all the latest improvements for Wool Cards. The latest and best and only Feed that will make yarn positively even.

ALSO

CHOQUETTE WASTE SAVER. Saves card fly.

Write for particulars.

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101 MILK STREET,

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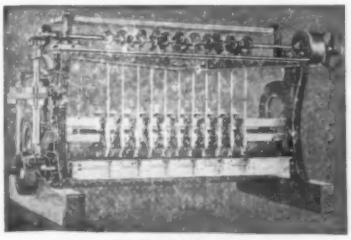
C. E. ROBERTS, Manager.

STEAM USERS of this country have upwards of 90,000 Steam Boilers under the inspection and insurance supervision of this company.

W. H. ALLEN, Ass't Manager.



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L. F. FALES

MANUFACTURER AND BUILDER OF

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FOR ALL PURPOSES WHERE A NUMBER OF ROWS OF SEAMS ARE REQUIRED

BUILT WITH ANY REQUIRED NUMBER OF NEEDLES.

DESIGNER OF SPECIAL MACHINERY | WALPOLE, MASS. U. S. A. | PAPER SLITTING MACHINES

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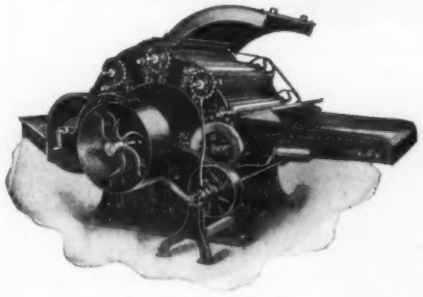

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Wool Burring and Picking Machinery.

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For Preparing, Finishing Gills and Drawing Boxes

New Screws made and old ones repaired and thoroughly case-hardened

Repairs and new parts for curled hair machinery. Fallers of every description made. Change Gears, 5-8, 7-16, 3-8 and 1-4 inch pitch kept on hand. All kinds of new Fluted Rollers, for Combs, Gills, Drawing and Spinning; also Refluting old ones. Improved Roller Covering Machine.

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Card Grinders

TRAVERSE WHEEL AND LONG ROLL

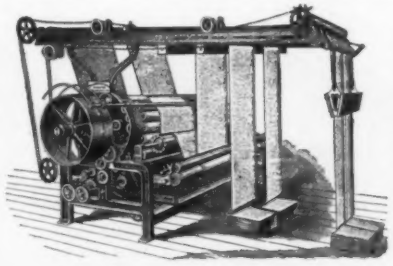
Particular Attention Paid to Repairing Grinders of All Kinds and Makes

LOWELL, MASS.

ECLIPSE NAPPING MACHINE.

Fabric in Direct Contact with the Napping Rollers all around the Drum.

Greater Production. Better Finish. Easier Threaded. No Shifting of Filling. Better results than can be obtained with teasels.



Long or short nap as desired on cotton or woolen goods, from the lightest to the heaviest.

No heavier napping on the sides than in the centre.

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Special Machinery Built **General Machinery Repairs**

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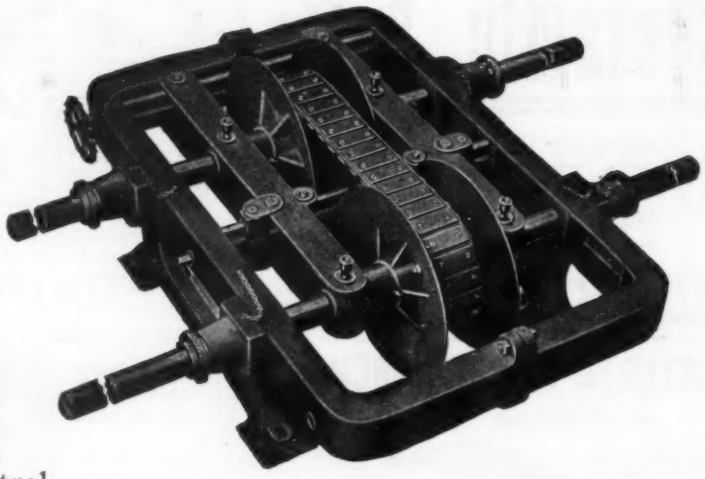
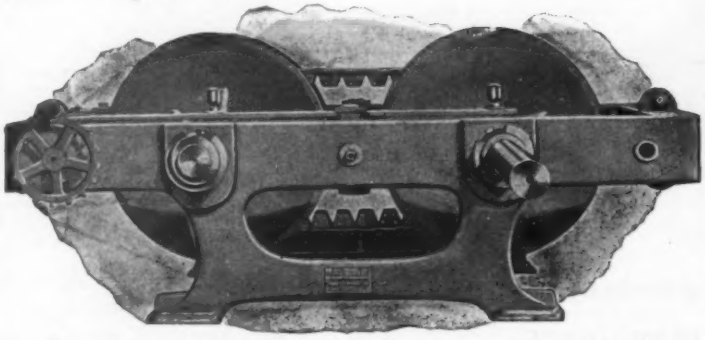
VARIABLE SPEED TRANSMISSION

Gives you absolutely any speed on any kind of machinery, without stopping the machinery, shifting a belt or interfering with the work in progress in the least. It is simple, compact and reliable. Built in thirteen different numbers and seven classes to meet all problems of speed control.





Three thousand in daily operation, many of them driving cotton, woolen, bleaching, dyeing and print machinery, in the largest and most progressive plants of the United States.

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Mill Sewing Machines

No. 9—Portable Foot-Power Rotary Sewing Machine.

It is especially adapted for use in Cotton and Woollen Mills, Bleacheries, Print Works at the Printing Machines, in Dye Works, Cloth Rooms, at the Fulling Mill, Shears, Calendars, Gigs, Drying Machines, etc., or any of the different finishing processes in textile mills.

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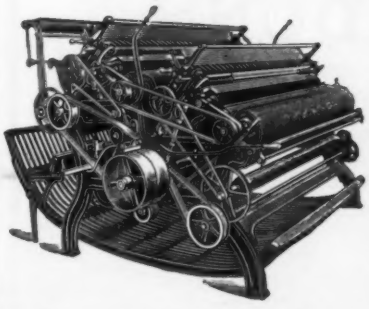

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Original Makers Samples Sent

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(WM. J. BUCKLEY) **Gun Mill, Patterson, N. J.**

Manufacturer of all kinds of SPINDLES, FLYERS, RINGS, TUBES, CAPS, etc., for Cotton, Silk, Flax, Woolen and Worsted Machinery.

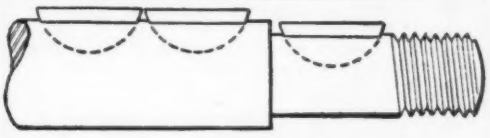
Roving Spindles and Flyers a Specialty. Light Forgings.

REPAIRING OF ALL KINDS.

Key Seating Attachment

FOR

Whiton Gear Cutter



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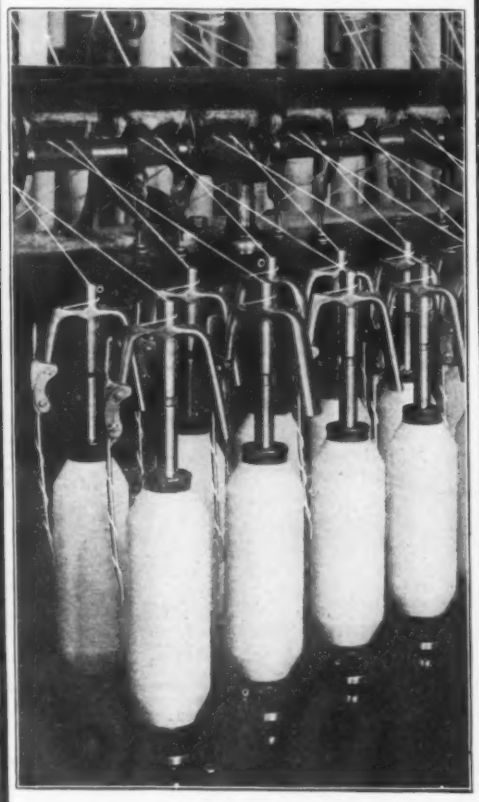
Presents new principles and methods in Flyer construction that have proved their value and made its use of marked advantage.



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are built with 7x3 Dunn Flyers on 4½" space frame with the further advantage of being able to run as fine as 15 hank roving on same flyers. Further information may be promptly obtained by addressing the

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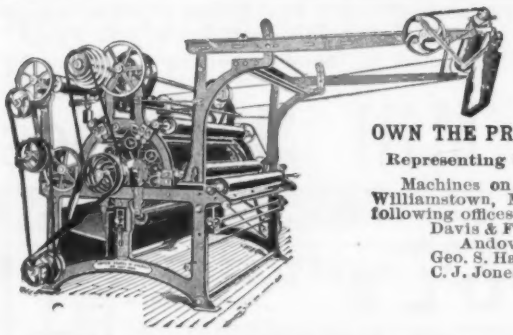

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FAST-RUNNING NON-OIL-LEAKING DOFFING COMB

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2. Can be run at highest speed
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1. Increases production 10 to 40 per cent.
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3. Adaptable to fine or coarse numbers of yarn
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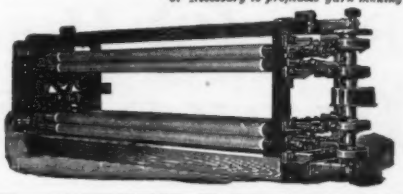
5. Now working on every grade of stock carded
6. Necessary to profitable yarn making



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Patent Flexible Steel Bed. Pressure automatically appplied by power.

1 6/4 double bed second-hand press
1 8/4 " " " "
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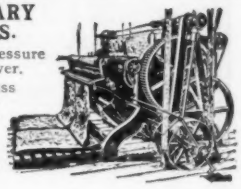
at a bargain.



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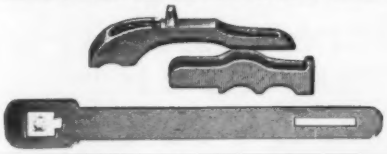

The weight can be taken off and put on to the middle rolls, without stopping your frames, when long staple cotton is used.

THE STIRRUP IS ALWAYS IN PLACE.
NO BENT STIRRUP RESTING ON ROLLS.

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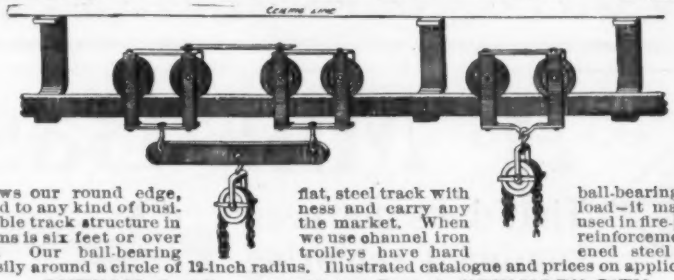

The above shows our round edge, flat, steel track with ball-bearing trolleys, both single and double, adapted to any kind of business and most durable track structure in use in fire-proof buildings where span between beams is six feet or over ness and carry any reinforcement with short intermediate hangers. Our ball-bearing the market. When ened steel centres and are so made as to turn easily around a circle of 12-inch radius. Illustrated catalogue and prices on application. we use channel iron trolleys have hard

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For Cotton, Woolen, Worsted, Silk and Flax Machinery. Manufacturers and Repairers. Also Flyers, Steel Caps, Bolsters, Steps, Tubes, Etc.

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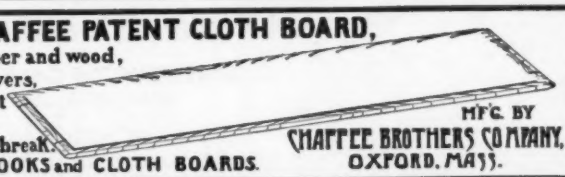
SAVE Their Cost In Freight.

THE CHAFFEE PATENT CLOTH BOARD,

Made of paper and wood,
Needs no covers,
Will not split or warp;
Not liable to break.



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BOX SHOOKS and CLOTH BOARDS.

Clean LIGHT Strong

Shaw's "Victor" Travelers

Manufactured by

VICTOR SHAW RING TRAVELER CO.

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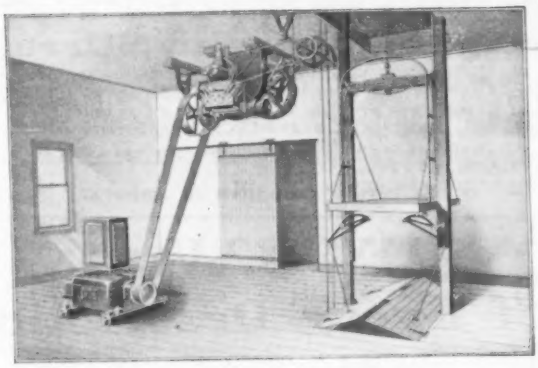

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Screw Electric FREIGHT ELEVATOR

Moderate Cost, especially if you buy f.o.b. Phila., and have your own mechanic erect from our drawings.

Economy in Running—Current used only while car is in motion—proper counter-balancing—**Hindley Worm Gearing**—few repairs.

Safety—Safety clutch on car, automatic stops on machine, **switch directly on machine** (instead of at the end of a chain). Elevator substantial throughout.

Any size, capacity or speed, direct or alternating current.

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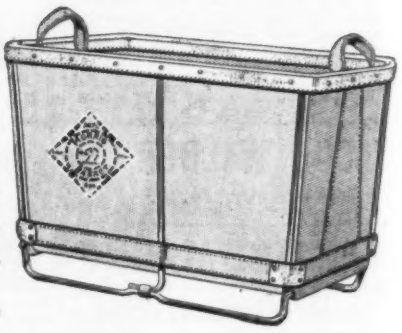
A Mill Basket

That does not need continual repairing

Is the one to buy.



The Morris Duck Basket has no wooden runners to replace, The bottom is protected by steel bands and cannot come in contact with the floor. Booklet No. 4 explains its superiority over other baskets. Ask for copy.

MORRIS & CO., Groveville, N. J.

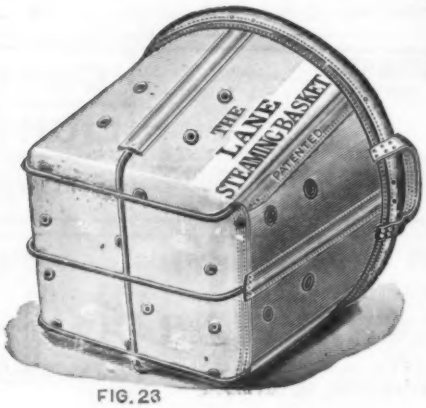


FIG. 23

The Lane Patent Steel Frame Canvas Steaming Basket.

MADE WITH OR WITHOUT WOODEN SHOES, AS REQUIRED.

Adapted to withstand the severe test of steaming better than any other basket, as it is constructed of such materials, and in such a manner as to be unaffected by steam, heat or moisture.

The steadily increasing demand for the Lane Patent Steaming Basket demonstrates the truth of our claims.

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Manufacturers,

Formerly located at Port Chester, N. Y. Poughkeepsie, N. Y.

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SEAMLESS MANILLA FIBRE ROVING CANS.

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AMERICAN VULCANIZED FIBRE COMPANY,

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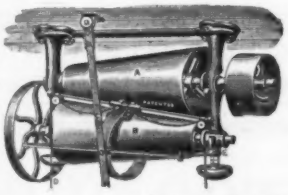
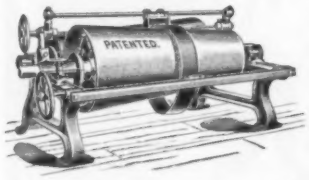
EVANS' FRICTION CONES.

Eight Thousand Sets in Operation in This Country and Europe.

A partial list of manufacturers who have Evans' Friction Cone Pulleys in operation, transmitting from ONE TO FORTY HORSEPOWER: National Biscuit Co., Richmond, Ind., 300 sets. Merrimack Mfg. Co., Lowell, Mass. 20 sets. Arnold Print Works, No. Adams, Mass., 11 sets. John & James Dobson, Philadelphia, Pa., 34 sets. Stinson Bros., Philadelphia, Pa., 40 sets. Frederic J. Falding, New York, N.Y., 30 sets.





Smith & Winchester Co., So. Windham, Conn., 250 sets. Furguson & McRae, Belfast, Ireland, 23 sets. Mercantile Laundry, So. Windham, Conn., 250 sets. Washburn & Moen, Worcester, Mass., large number, all sizes. Dennison Tag Co., Boston, Mass., large number, small sizes. Saco & Pettee Machine Co., Newton, Mass., 275 sets. Pacific Mills, Lawrence, Mass., 13 sets.

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Vulcan Fibre Roving Can.

BODY—Vulcanized Fibre. SIDE SEAM—Riveted with Patented Clinched Rivets. RINGS—Tinned Steel, Brazed Joints, Curled Edges. BOTTOM—IXXX. Tin Star Corrugation; Fastened without the use of nails or screws, will not crack, warp or shrink and cannot come out. FINISH—Coated inside and out with moisture proof coating, handsome and smooth. WEIGHT—About one-half pound per inch diameter. SIZE—All cans to any exact size, perfectly round and true. DURABILITY—Superior to any other can.

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HILL'S IXXX TIN AND GALVANIZED IRON DYE HOUSE CAN.

James Hill Manufacturing Co.,

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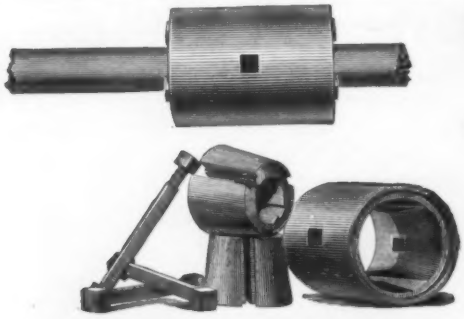

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DOUBLE CONE VISE COUPLING

has a way of holding shafts together, that no other COUPLING can equal.

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FOR ALL KINDS AND WIDTHS OF GOODS.

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ESPECIALLY ADAPTED FOR MILL USE.

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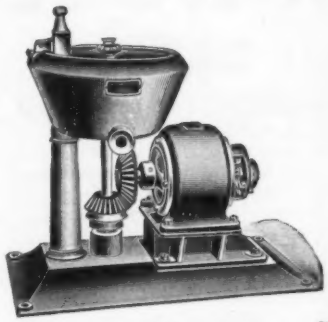

MOTOR WOUND FOR ANY VOLTAGE.

Separates oil from bolts, nuts, and scraps of all kind—oil that would otherwise be wasted, and makes it as good as it ever was, for further use. **Send for Catalogue.**

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Incorporated 1864. Founded 1845.

DUST PROOF, OIL TIGHT.

CHEAPER THAN DIRT

Dirt, Dust, Lint and Grit in the Bearings of Machine means Big Repair Bills. A Little Money Will Buy a Large Lot of

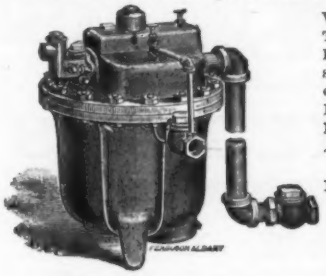
TUCKER OIL CUPS

Send for Catalog and Samples.

W. & C. F. TUCKER, .. HARTFORD, CONN.

STEAM TRAPS

NEW FEATURES: Wearing Parts, Valve and Seat Renewable.



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No Elastic Gaskets, all Joints Ground Metal and Metal.

SEND FOR **Catalogues A, B, and C.**

Class A Return Trap

ALBANY STEAM TRAP CO.,

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Established 1870.

FRED'K TOWNSEND, Pres. JAMES H. BLESSING, Gen. Mgr.

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Vertical Water Tube

BOILERS

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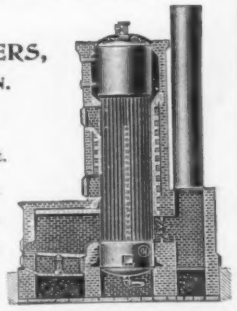

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BRETON OIL vs. LARD OIL.

"Equal weights of cotton waste are soaked with same weights of Breton and Lard Oils, then warmed in the oven, under same conditions, to a temperature of 127°C, with following results:—

	Temperature of oven.	*Duration of test.*	*Temperature of Waste.*	**Difference in favor of Breton.**
Breton.....	127°	3h. 37m.	117.5°	47.5°
Lard.....	127°	"	165.0°	Lard about to burn.

In a similar experiment, the waste heated to 217°; with Lard, on being thrown out took fire in an hour, while the waste oiled with Breton remained unchanged, showing no sign of oxidation."

See point No 8 next month. Breton vs. Red Oil.

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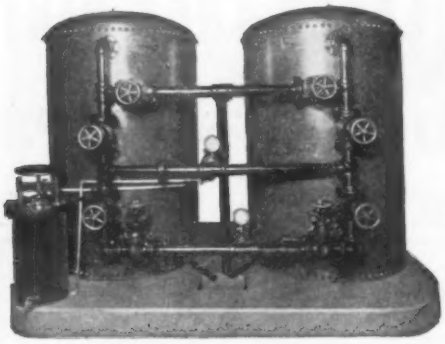

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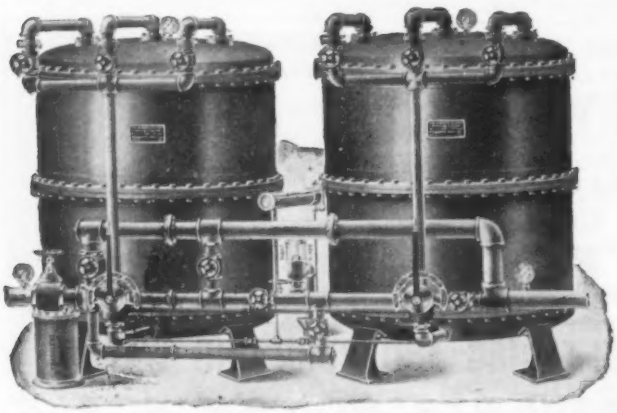

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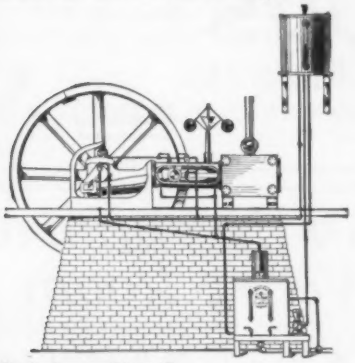

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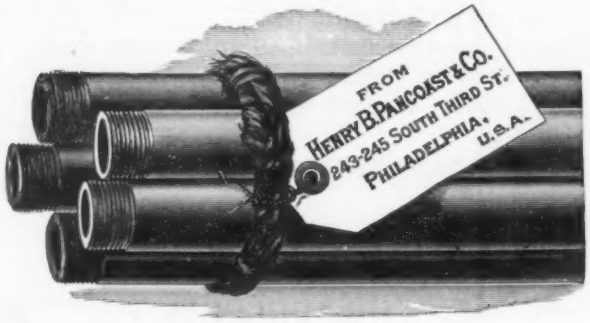

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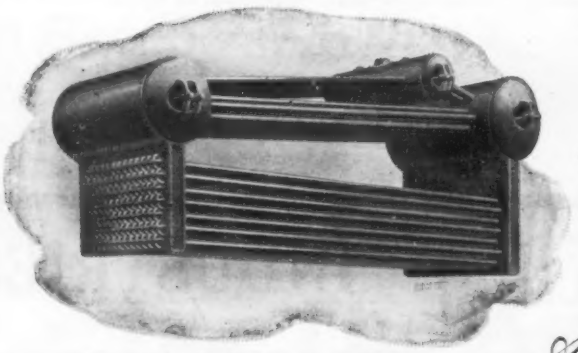

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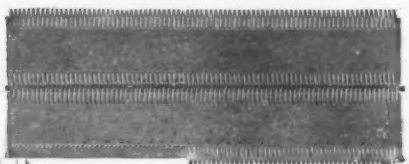

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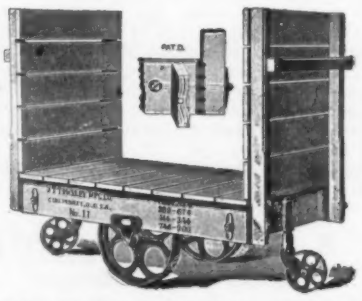

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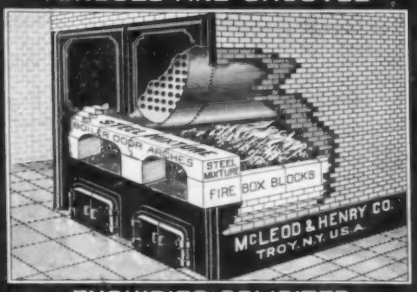

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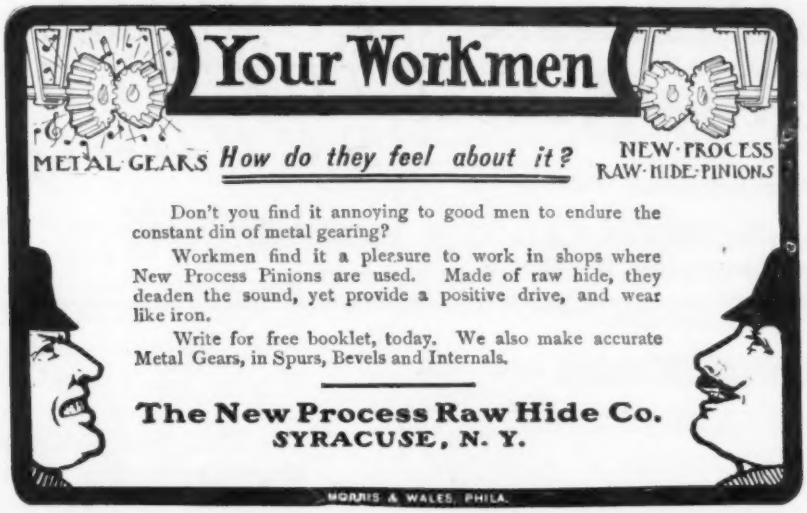
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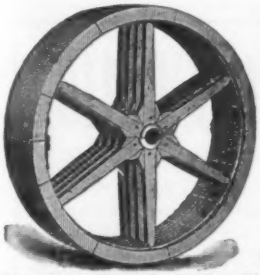

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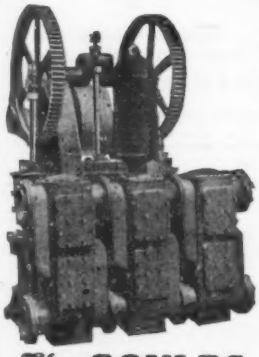

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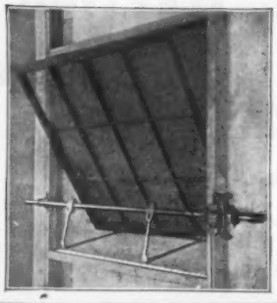

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OFFICIAL DIRECTORY of TEXTILE INDUSTRIES

for 1904

The Annual Official Directory for 1904, compiled by the Textile World Record, is now ready for delivery

Abstract of Table of Contents.

PART I. Textile Manufacturers.

Textile Establishments of the United States and Canada
Alphabetical Index of all mills in the United States and Canada.
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Number of Spindles and Looms in the United States.
25 Textile Maps, showing location of cities and towns where there are mills.

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List of Yarn Dealers and Agents.

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PART V.

Agents and Buyers of Textile Fabrics.

PART VI.

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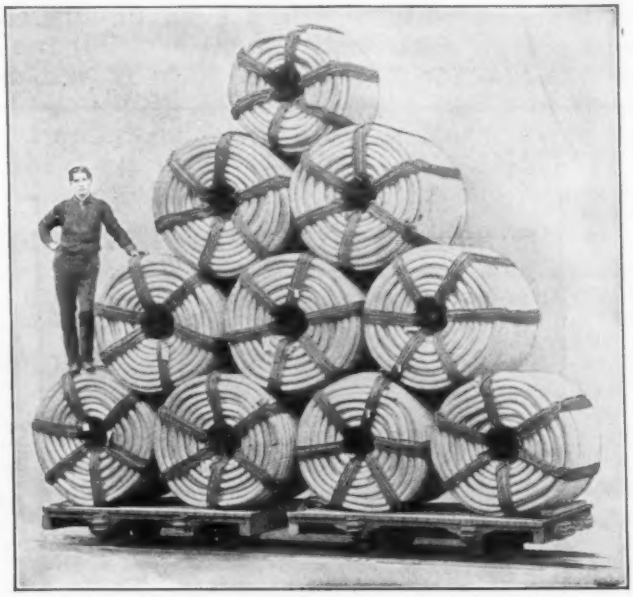

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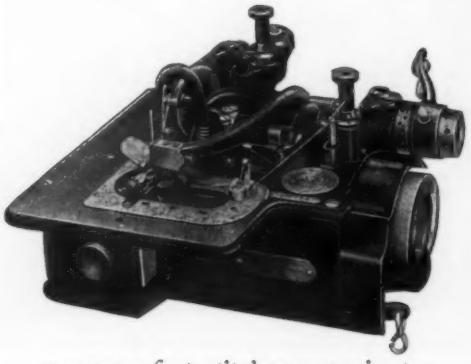

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is published annually in the spring by LORD & NAGLE CO. It is a book of about 500 pages, well printed and bound. Office Edition $2.50. Traveler's Edition, $2.00.

PART I. Contains a complete directory of all the textile establishments in the United States and Canada. It tells what goods are made, the number of sets of cards, spindles, looms, whether and what they dye or finish, steam or water power, who the selling agents are, the names of the officers, superintendent and buyer.

There are 22 textile maps; gives population of town and railroad connections.

PART II. Is the Yarn Trade Index, containing classified lists of yarn spinners, arranged according to kind of yarn, size and number spun, etc. All the mills with worsted machinery are included in this section.

PART III. Contains Classified List of mills doing order and commission work, also dyeing, finishing, bleaching and printing establishments, classified according to the kind of work done, and so far as possible giving width of goods handled; also shoddy, extract and flock manufacturers and wool scouring establishments.

PART IV. Manufacturer's Selling Agents and Dry Goods Commission Merchants, giving the name and address of concern, character of goods handled, different departments, with managers, list of manufacturing clothiers, and suit and cloak manufacturers, giving specialties and buyers names. A list of city offices of textile mills is given.

PART V. Dealers and Brokers in raw materials and stock, including wool and shoddy dealers and brokers, cotton dealers and brokers, factors and buyers and wholesale rag dealers making a speciality of textile interests.

PART VI. Buyers Index of Textile Machinery and Supplies, and statistics showing textile machinery in the United States, giving spindles, looms, knitting machines, etc.

The Directory of the Knitting Trade in the United States and Canada

is published early each year by Lord & Nagle Company. It is a complete directory of all the establishments in the United States and Canada manufacturing knit goods. It gives the location of the mill, the capital stock, names of the officers, superintendent and buyer, class of goods made, the machinery, including number of knitting machines and sewing machines, selling agents, if any, and in most cases the class of yarn bought. It also contains a list of commission houses making a specialty of knit goods, and jobbers and large retailers having knit goods department, in most cases giving the names of manager in charge of knit goods. The book is small so that it may be carried in the pocket. Price is $1.00.

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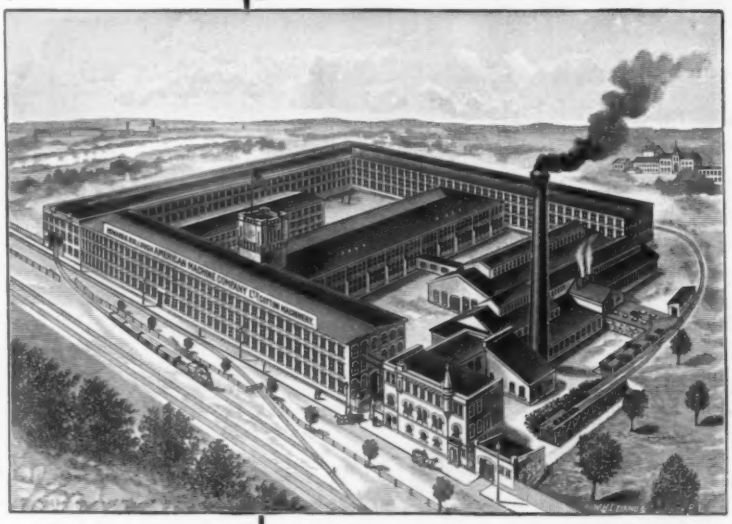

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VOL. 27. (NEW SERIES.) AUGUST, 1904 No. 5.

Monthly Comment.

The Reduction of Wages in Cotton Mills.

Another reduction of wages of the cotton mills of Fall River was announced last month, the cut being 12 1/2 per cent. This brings the wage scale to a basis of 17.325 cents per cut for weaving regular print cloth. During the past twenty years the lowest wage level reached in the Fall River mills was 16 cents, which prevailed for eight months following Aug. 30, 1894, and fourteen months following Jan. 1, 1898. The highest point reached was 21 7/8 cents; this price was paid for twenty months following March 17, 1902. The wage schedule is regulated largely by the cost of cotton and the selling price of cloth. Before the production of the Fall River mills became so diversified as at present, the bulk of the product consisted of print cloth. During that period, wages were adjusted by a sliding scale based on what was termed the "margin" of manufacturing. This "margin" was originally the difference between the selling price of 45 yards of regular print cloth and the cost of 8 pounds of middling upland cotton. If, for example, middling cotton was selling for 11 1/4 cents and regular print cloth at 3 1/8 cents, as at present, the margin would be 50 6/10 cents, calculated as follows:

45 yards, 3 1/8 c.	$1.406
8 lbs. cotton, 11 1/4 c. ..	.900
Margin	$0.506

As the product of the Fall River mills became more diversified the method of figuring the margin was changed by substituting 22 1/2 yards of regular print cloths and 16.36 yards of 38 1/2-inch 64 by 64 print cloth for the 45 yards of the regular fabric above mentioned. Both methods were practically abandoned some years ago owing to the increase in the variety of the goods made by the mills, which made it impossible to base wages on a margin calculated on print cloths alone.

This margin is, however, still the best method of comparing the business conditions at different periods. The following table gives various Fall River wage schedules since 1884, and the margin of manufacturing at the beginning of each wage period or when a new schedule went into effect.

	Weaving	Cotton	Cloth	Margin
Feb. 4, 1884	18.50	10 12/16	3 10/16	.77
Jan. 19, 1885....	16.50	11 1/16	3 3/16	.55
March 1, 1886...	18.15	8 15/16	3 3/16	.72
Feb. 13, 1888....	19.00	10 10/16	4	.95
July 11, 1892....	19.60	7 15/16	3 6/16	.94
Dec. 5, 1892.....	21.00	9 9/16	4 1/16	1.07
Sept. 11, 1893...	18.00	7 3/16	2 12/16	.66
Aug. 30, 1894....	16.00	6 15/16	2 10/16	.63

April 22, 1895....	18.00	6 15/16	2 12/16	.68
Jan. 1, 1898.....	16.00	5 14/16	2 4/16	.54
Feb. 27, 1899....	18.00	6 8/16	2 12/16	.71¾
Dec. 11, 1899....	19.80	7 11/16	3 4/16	.84½
March 17, 1902..	21.78	9 1/8	3	.59
Nov. 23, 1903...	19.80	11 1/4	3 1/4	.56
July 25, 1904....	17.25	11 1/4	3 1/8	.50½

In 1885, the wage basis was 16 1/2 cents and the margin, 55 cents. Today the wage basis is 8/10 cent higher, while the margin is 50 1/2 cents, or 4 1/2 cents lower.

At the two periods when wages were at the lowest point, 16 cents in 1894 and 1898, the manufacturing margin was 63 and 54 cents respectively, or 12 1/2 and 3 1/2 cents above the margin when the recent reduction was announced and which left the wages 1 3/10 cents above the lowest level.

At the present time there are peculiar conditions to be taken into consideration. The price of cotton, 11 1/4 cents, is as high as at the time of any change in wages during the past twenty years. The present price of cotton, however, is due to a general cessation of buying and does not represent the real balance between supply and demand. Since the beginning of 1904, cotton has risen above 17 cents, the average for the current year up to this time being fully 13 1/2 cents. This high price of cotton for the past seven months forced the manufacturers in Europe and America to restrict production nearly one half, and to buy as sparingly as possible. This policy of inaction has brought cotton down to what is still a high price as compared with the prices of the past two decades. The present is the time between seasons when the old crop has been delivered to the mills and the new crop is still growing. The present quotation is largely nominal because there is but a small part of the old crop to be sold. A general starting of the idle mills throughout the world and a resumption of buying by them, would unquestionably send the price of cotton up to record figures.

Another factor is the apathy of the goods market. Everywhere, and particularly in Europe, the market is overstocked with goods and this accounts for the refusal of buyers of goods to pay prices commensurate with the increase in the cost of the raw material.

The operatives at Fall River have refused to accept the reduction of 12 1/2 per cent., and as a result the mills of that city are closed, each side waiting for the other to yield.

Samples of Woolen Cloth from Europe.

A little more than six months ago, we asked Secretary Cortelyou of the Department of Commerce and Labor to have the United States Consuls in Europe collect and send to the Department samples of seasonable woolen and worsted fabrics selling in their respective consular districts. We called attention to the great value of such samples of foreign products to American manufacturers, and offered to analyze the samples received provided we were allowed to publish the results for the benefit of our readers. The suggestion met with the prompt approval of the Secretary, and suitable instructions were at once sent to the various European consulates. Since that time the consular corps have been diligently engaged in collecting woolen samples to be forwarded to Washington. The lot were recently sent to this office and comprise fabrics from nearly every country of Europe.

It is doubtful if a more extensive and representative collection of seasonable woolen and worsted fabrics was ever made. Certainly no such collection has ever before been placed before American manufacturers. The latest products of the skilled labor of French, German, Belgian, Austrian, Swiss, Russian, Swedish, Spanish, Italian and British woolen mills are here represented. The price, width and weight are given and enable one not only to study the construction and coloring, but also the market value of the products of the low priced and highly skilled operatives of Europe.

When we offered to analyze the samples we had no idea they were to be sent by the ten thousand. The large number compels a modification of the original plan. We propose to analyze as many of them as possible, publishing the results in this journal, with illustrations of the fabrics when this can be done. In the meantime we shall be pleased to show the collection to any one interested who may call at our Boston office. We can-

not give them away, but manufacturers will doubtless find a study of the collection of great value to them.

The collection comprises woolen and worsted fabrics in light and heavy weights for both men's and women's wear. Manufacturers, superintendents and designers will recognize at once the great opportunity thus afforded to inspect the latest fabrics from European mills.

Theft of Silk.

From time immemorial the silk manufacturers of France have suffered from the practice of stealing silk by the dyers. The conditions in this industry are very favorable for this crime. The silk loses weight during the boiling-off process, and when the material is dyed there is more or less increase of weight due to the absorption of dyestuff. The weight of silk is generally increased by the weighting process so that the weight after boiling-off or dyeing may be greater than in the gum. The stealing of silk, called "piquage d'onces", is done while the silk is in the possession of the dyer, to whom it is sent to be boiled off or dyed. It is impossible to detect the theft by weighing the material before and after it has been in the dyer's possession, because of the uncertainty regarding the loss or gain in weight due to the boiling-off and dyeing processes. The dyer can easily adjust his treatment of the material so that the final weight will compensate for the silk he has taken from the lot, and in any event his customer is unable to detect the loss.

In 1878, Persoz, writing on this subject, stated that the practice of "piquage d'onces" was very prevalent in the French silk industry. He mentioned two methods which had been proposed for detecting the fraud. One consisted in reeling and weighing the silk before and after treatment by the dyer, and noting whether the actual weight corresponded with the calculated weight as based on the count. The difficulty with this system was the variation in the size and the change of weight of different parts of the lot. The manufacturer could not be certain, either, that his reeled count was the exact average or that the change of weight had been uniform throughout the lot. The other method consisted in weighing and marking certain hanks in different parts of the lot both before and after treatment, and then calculating what should be the total weight of the batch. A comparison of the result with the actual weight was supposed to indicate whether all of the lot had been returned. This method was considered of such merit that a gold medal was conferred on the originator, M. Arnaud. Evidently a French medal, even of gold, was no better proof of merit in 1878 than at the present time, for "piquage d'onces" continued to flourish and became so great an evil that the French silk mauufacturers formed an association entitled *Societe de garantie contre le piquage d'once*, to protect the trade from the robber dyers. This society has been supported by voluntary contributions and has vigorously prosecuted offenders charged with the crime of piquage d'onces. A report of its operations for the first half of the present year 1904, shows that the stealing of silk is still going on. The report states that during this period of six months the society has interfered in twenty-seven cases of "piquage d'once," involving fifty accused persons. The convictions have resulted in terms of imprisonment varying from six days to three years, and in prohibition of residence for five years. It adds that notwithstanding these convictions the crime is not decreasing and urges the members of the society to report promptly all cases in which they may be the victims, in order that the criminals may be prosecuted.

We have made inquiries in the silk trade and are informed that the practice of "piquage d'onces" does not prevail in America. There may be isolated cases, but our inquiries have brought the reply that as a rule American silk dyers do not steal silk from their customers. Whether this is due to a different level of morality or a difference in opportunity we cannot say. It is, however, a striking fact that the evil is so great in France as to necessitate a special oganization for its suppression.

Foreign Trade in Cotton Goods.

The exports of cotton goods for the year ending June, 1904, amounted to but $20,700,000. This is a decrease of $10,200,000, or 33 1/3 per cent. from 1903, when our exports of cotton reached $30,900,000. The decline was due almost entirely to the war between Russia and Japan, which has caused a temporary loss of the Manchurian trade.

Our imports of cotton goods during the past 12 months were valued at $49,490,000, a slight decrease from the preceding year when the total was $52,460,000, the largest yearly total on record.

Foreign Trade in Cotton.

The effect of high priced cotton is plainly seen by comparing the exports for the past 12 months with previous years. The average price of exported cotton per pound for the past year was 12 1/10 cents. This is nearly 2 cents above the highest yearly average for the preceding 14 years. 3,620,000,000 lbs. of cotton were exported in the past year, the total value being $370,700,000. It is interesting to compare these figures with the totals for 1899 when the average price of exported cotton was but 5.55 cents, the lowest on record. In that year the total weight was 3,773,000,000 lbs., valued at only $209,600,000. Thus we sold during the past year 713,000,000 lbs. less of cotton and received $161,100,000 more for it.

The increase of cost of the cotton imported is insignificant compared with the gain on exports. During the past year the imports amounted to 48,840,000 lbs., valued at $8,540,000. This imported cotton consisted of high priced Egyptian and Peruvian, the average value being 17.47 cents per pound. In 1899 the imports of cotton amounted to 50,200,000 lbs., valued at $5,010,000, or nearly 10 cents per pound. We thus paid during the past year $3,530,000 more for 1,400,000 lbs. less of cotton than in 1899.

Ramie in England.

The ramie fibre has been found to be specially adapted for the incandescent mantles on gas jets and it is reported that a number of mills have been started recently in England to manufacture ramie yarn for this purpose. Rochdale, Halifax and Belfast each have one of these mills and three others have been established in Yorkshire. It is claimed that the superiority of ramie for gas light mantles is due to the fact that it absorbs less of the expensive chemicals used in preparing the mantles than is absorbed by either flax or cotton. Ramie yarn suitable for mantles is selling in England at $1.25 per pound, while the ramie top is quoted at 42 cents.

Artificial Cotton.

Experiments are being made in Bavaria to manufacture artificial cotton from pine trees. In other words, to find a source of cotton supply outside of America Europeans are turning not only to the undeveloped colonies, but also to science in the hope that some means may be found to obtain cotton. Already artificial substitutes have been found for silk and indigo and this strengthens the hope that artificial cotton may become a commercial fact.

The Bulletin of the French Chamber of Commerce at Milan recently published an account of the experiments so far made in this direction. According to this authority artificial cotton has been produced in a small way from cellulose obtained from the bark and knots of fir trees. The wood is first crushed into a fibrous mass, then subjected to steam pressure in a closed cylinder for ten hours when a solution of bisulphate of soda is introduced and the material kept under pressure for thirty-six hours more. This makes the material white and it is then washed and ground to a paste. The next operation is that of bleaching by chloride of lime, after which the material is squeezed between heavy rollers to remove the water. The resulting product is pure cellulose which is next heated in a boiler with a mixture of hydrochloric and nitric acid. Castor oil, casein and gelatine are added to give strength to the fibre.

The pasty mass is then converted into fine filaments by being forced under pressure through small apertures. These filaments first fall on a moving rubber apron which carries them into a solution of carbonate of soda and then over two drying cylinders. In

order to impart the necessary solidity and strength the material is passed through a solution of ammonia and then through cold water which completes the operation. It is said that the artificial cotton compares very favorably with the natural product.

Warehousing Cotton.

The cotton planters of the South are becoming interested in the warehouse system of marketing cotton. The chief advantage claimed for this method is the elimination of the speculator. This would be of incalculable benefit to both planter and manufacturer, as the business of both is now disarranged by the rapid fluctuations due to manipulation on exchanges and which bear no relation to the balance of supply and demand. The Texas Farmers' Congress appointed a committee to report on this subject. Their conclusions are as follows:

1. That an imperative necessity exists for such warehousing of cotton to the end that the crop may remain under the control of the farmers, merchants, bankers and others producing it until demand therefor arises by spinners for actual consumption.

2. That such control would lessen if not altogether suppress the vice of gambling in futures now conducted under the false mask of legitimate trade, a vice destructive of the wellbeing alike of producers and consumers of cotton.

3. That warehousing all, or even a portion of the crop, not in immediate demand, would cause that portion actually offered to bring a higher price, yet not higher than its fair value, whilst the portion warehoused under the contract of men producing raw material aggregating over $500,000,000 annually before and over $100,000,000 after manufacture would exert such powerful influences in the world of industry that the highest fair price could be demanded.

4. That the increased price savings on fair classification and fair weights and the incidental benefits to the farmers, merchants, bankers and other business interests of the country resulting from a warehousing system, will aggregate not less than $10 per bale over $100,000,000 to the cotton growing states and this annually flowing through the arteries of trade will quicken into renewed life and vigor every effort and enterprise of all our people.

5. That the construction and maintenance of mills at the field would be encouraged by their being able to obtain adequate supplies of cotton directly from the warehouse when actually needed instead of being required to lay up a year's supply of cotton on borrowed capital at high rates of interest as at present.

6. That the binding together of our people, the better acquaintance with the condition existing among us from time to time and other incidental benefits to be derived from a uniform system of warehousing cotton by our own people would be of untold value to the country at large and would the first season repay many fold the cost of the whole system.

Overproduction of Cotton Goods.

Whenever affairs fail to run smoothly in Europe the first impulse, which is generally followed, is to call a Congress to devise a remedy for the difficulty. A Congress is the panacea for every real or imaginary ill, from a Russian army at the gates of Constantinople to the confusion in numbering yarn. The existing disparity between the cost of raw cotton and the selling price of goods has been no exception to the rule. In addition to the Congress at Zurich, the cotton manufacturers of France met in a Congress at Paris some weeks ago and discussed remedies for their business troubles. The occasion is noteworthy because of the address by the French statesman, M. Meline, who pointed out that the difficulty in the cotton trade is due to the overproduction of cotton goods. Although he was considering the question from the standpoint of the French industry, his opinions, based on a broad view of economic questions, are applicable to the situation in other countries. Instead of pointing to the scarcity of raw cotton as the cause of the trouble and leading his hearers to believe that their prosperity depended upon the production of more cotton, he laid emphasis in the following words on the evils of overproduction of goods:

Cotton manufacturers are aware that the troubles that have oppressed the industry for several years past are not due to an ordinary and superficial accident, that it is not a temporary commercial vicissitude likely to pass away of its own accord. They recognize that the difficulty is a morbid and permanent condition, arising from profound and persistent causes which must be remedied before the difficulty itself will disappear. This view has been accepted for a long time by advanced thinkers among men of affairs. Their opinion, however, would have remained without echo and without influence if the truth had not been brought to their minds by the action of foreigners who have raised the cry of alarm and warned the cotton industry of the catastrophe toward which it is drifting.

The principal cause of the disarrangement of the cotton industry is overproduction. What are the causes of this overproduction? Free traders answer without hesitation that it is the high tariffs which, insuring exceptional profits to the producer, direct capital to manufacturing enterprises and stimulate the building of new mills or the enlargement of old ones. This is true only in a certain degree. It is certain that high tariffs stimulate the production

by reason of the scarcity which they give to the home market. It is, however, a great error to suppose that this is the principal cause of overproduction. Such an idea is disproved by the example of free trade England, which is far ahead of us in making goods for the over-supplied markets of the world.

The real causes, which exist in all countries, are found first in scientific progress which incessantly develops the productive power of a country by improving the machinery and processes of production, secondly, because of a widespread economic error The majority of manufacturers are possessed with the idea of increasing their plant in order to reduce expenses of production; as if the profit resulting from this economy of expense could compensate for the loss resulting from overloaded markets and consequent low priced goods.

The industrial concentration which is the consequence of this mistaken idea is one of the most significant phenomena of the present economic evolution. Whatever may be the cause of the overproduction it is undesirable and no good purpose is served by mutual recriminations on this point. This is a fact which should be placed on record and studied. Its most evident factor is an accumulation of stocks which press heavily on the market. No matter how much the stocks may be reduced by the present short time, it is, nevertheless, indispensable in order to restore a healthy condition of affairs to restrict production within reasonable limits. The first question for this Congress to solve is by what means the overproduction can be prevented and the stock of goods reduced. As direct means by the destruction of spindles and looms are out of the question the remedy can be found only by indirect, roundabout methods. The first and most efficacious is the restriction of production by short time until the equilibrium between production and consumption is restored.

The overproduction of cotton goods, which M. Meline calls to the attention of French manufacturers, has reduced the selling price of goods by producing more than could be consumed, and at the same time raised the cost of raw material by increasing the demand for it beyond the capacity for production. For the double evil of overproduction of goods European manufacturers seek a remedy in the overproduction of raw cotton. Goods are selling at such low prices that they cannot be manufactured at a profit unless the price of cotton is forced to a figure that would mean loss to the cotton grower. In other words, Europeans are calling for cheap cotton to enable them to sell their manufactured product at a profit in an overstocked market.

It is against the folly of such a course that M. Meline's sensible words are directed. The wisdom of his advice is confirmed by the effect of short time. The restriction of production in European cotton mills for many weeks has been equivalent to the complete cessation of work by 25,000,000 spindles. The effect has been immediate on the raw cotton market, but very slight on the market for manufactured goods. Middling uplands has dropped from 15 to 11 cents, but the price of yarn and cloth has remained practically unchanged. Facts thus confirm the statement of M. Meline and also point to the only remedy. Instead of stimulation to production of goods until ruin faces the mills, let Europeans encourage the emigration of their unemployed to our Southern fields where cotton can be raised with less effort than in any other place on earth.

Cotton in South America.

As time passes it becomes evident that the supply of cotton for the world's wants is limited by the supply of labor for cultivating it. Although the climate, soil and area of our Southern States are superior to all the rest of the world for the growing of cotton, yet there are sections outside of the United States, from which important additions to the cotton supply could be secured if the labor could be obtained. Men who have studied the problem believe that Paraguay is one of the most promising fields for cotton growing, but there as elsewhere attempts to establish the industry are blocked by the scarcity of labor.

E. L. Ruffin, of Asuncion, Paraguay, refers to this subject in an article that will appear in an early issue of this magazine, and states that the population of the country has been so reduced by the ravages of war that it would be impossible to hire workers to cultivate the fields. The Belgian consul at Asuncion confirms this statement in a recent report, in which he says that cotton is indigenous to Paraguay, and has been cultivated by the natives for centuries, but the annual output of raw cotton has never exceeded 150 to 200 tons. The soil is said to be singularly adapted for the growth of this staple. It is now possible to obtain good land there at $1.50 to $3.00 per acre.

Land and climate may be all right, but good cotton will not grow even in the United States without human hands and intelligence.

Reducing the Labor Cost of Woolen Goods.

A correspondent asks what process of manufacturing carded woolen goods offers the best opportunity for effecting economies in the cost of labor by improving the machinery or process. The improvements in machinery and processes which have changed the manufacture of cotton, linen and woolen goods from a hand industry of the household to its present state, were made during the last one hundred and twenty-five years. Previous to that time loose fibrous materials were converted into yarn and cloth by hand. No reference is here made to the silk industry for which the material is spun by natural means.

The power card, spinning frame, mule and loom have, during a comparatively recent period, caused the household industry of manufacturing cotton, linen and woolen goods to disappear. Its place has been taken by the factory with its improved power machinery and processes by which the product of one operative is equal to that of many hundreds working by hand methods.

In the carded wool industry the adoption of power machinery has been even more recent than in the other branches of the textile industry. It is scarcely forty years since the introduction of the automatic machine for spinning woolen yarn. Previous to that event the hand jack was generally used. The draft was regulated and the winding done by hand. Self feeds, loom stop motions and other important inventions as well as the general improvement in construction have supplemented the power spinning and weaving machinery and reduced the labor cost of manufacturing to a mere fraction of what it was before.

The two principal results of this remarkable development of labor-saving machinery are increased production and reduced cost. The capacity of textile machinery to produce goods has outstripped the means of distributing the product. The labor cost of production has been so reduced that further reduction of cost to the consumer is as likely to be made in the expenses of distribution and administration.

Of the different branches of textile manufacturing the labor cost is probably highest in the carded woolen industry, to which our correspondent refers. The labor cost of print cloth made from 30's yarn is estimated at 6 2/10 cents per pound in New England and as low as 4 cents per pound in the South where much lower wages and longer hours prevail. The labor cost of manufacturing white wool flannel made from 5 run yarn is about 17 cents per pound. In other words, the labor cost for making one pound of woolen cloth is three times as much as in the case of cotton cloth, although the cotton yarn is spun three times as fine as the woolen yarn. Natural conditions are likely to maintain the labor cost of manufacturing woolen cloth above that for making cotton goods. Aside from this condition, however, the carded woolen industry, as far as the cost per pound is concerned, offers a more promising field to the inventor of labor saving devices than does the manufacture of cotton goods.

To decide what process of manufacturing woolen goods offers the best opportunity for saving labor it will be necessary to compare the labor cost of the different departments. Following is a statement of the labor cost of a woolen mill for 11 months, during which the machinery was operated to its full capacity:

Sorting	$3373.28	4.1%
Dyeing	4068.18	4.9%
Carding	6084.68	7.4%
Spinning	5967.01	7.2%
Spooling and Dressing	4010.40	4.9%
Weaving	28129.00	34.1%
Finishing	14728.32	17.8%
Miscellaneous	16139.12	19.6%
	$82499.99	100%

The miscellaneous item amounting to nearly one-fifth of the total includes salaries of treasurer, superintendents and clerks,

wages of repair hands, watchmen and other general hands. This item can be eliminated from present consideration because any considerable economy here must be brought about by improved administration of affairs instead of by improved machinery. Of the remaining four-fifths the largest item is for weaving, amounting to over one-third of the total. This department, therefore, is the most promising for inventors. Sorting the wool, which amounts to 4 per cent., must always remain a hand process. The dyeing process, which cost nearly 5 per cent., was carried on by hand tubs and power piece tubs. The improved automatic raw stock dyeing machines now in general use would reduce this item. Carding and spinning combined amount to about 15 per cent. of the total and thus offer a good field for further improvement. Spooling and dressing is an important item amounting to 5 per cent., and the cost of labor in the finishing room amounts to nearly 18 per cent. The best opportunity for saving labor, however, lies in the weave room, and it is in this department of manufacturing woolen goods that the inventor is likely to meet with the greatest measure of success.

MEETING OF THE NEW ENGLAND COTTON MANUFACTURERS' ASSOCIATION.

The New England Cotton Manufacturers' Association will hold its Seventy-seventh meeting on Wednesday and Thursday, September 21 and 22, at the Mount Washington Hotel, Bretton Woods R. R. Station, N. H.

A special train of Pullman cars will leave the North Station, Boston, at 10.30 A. M., Tuesday, September 20, via Lowell, Nashua Junction, Manchester and Concord, arriving at Plymouth, N. H., at 2.05 P. M., where dinner will be served in the Pemigewasset House.

Leaving Plymouth at 2.50 P. M., the train will be due at Bretton Woods Station at 5.45 P. M.

The sessions will be held in the ball room of the Mount Washington on Wednesday and Thursday as will be announced in detail about September first.

Conveyances will run between the hotels each half hour without charge to the members of the party.

The hotel domain covers a tract of 10,000 acres in the beautiful intervale of the Ammonoosuc, including the picturesque falls near the hotel, and extends from the railroad to the base of Mount Washington.

On Friday, September 23, the special train of Pullman cars will leave Bretton Woods Station, at 1.30 P. M., and run through the Crawford Notch, arriving at Intervale Junction at 2.40 P. M., and due at Boston at 7.15 P. M.

Lunch will be served on Friday, at each hotel, at 12.00 noon; and baggage must be ready at 10.00 A. M., in order to be checked from the hotel to its destination.

Those who prefer to return to Boston via Plymouth can do so without extra charge, but in such cases the return tickets to Boston via Intervale Junction must be exchanged at Bretton Woods station for tickets to Boston via Plymouth.

Tickets for transportation, care of baggage, Pullman car seats, dinner at Plymouth, and stay at the Mount Washington can be obtained at the ticket office of the Boston & Maine Railroad, 322 Washington Street, corner Milk Street, Boston, on and after September first, for $19.75.

Secretary Woodbury has planned an interesting program for the meeting, which, with the attractive location, will doubtless result in a large attendance.

Harness Chain Stop Motion. John P. Thornton, Huddersfield, England, has placed on the market a loom attachment which causes the loom to stop when for any reason the warp or filling chain is broken or the links become doubled on each other.

Cut Marker. Willan & Mills, Blackburn, Eng. A cut marker by which the lengths of warp for shawls, dhooties, etc., are automatically adjusted to make allowance for the waste caused at the ends of the pieces by headings and thrums.

Seasonable Fabrics.

MEN'S WEAR WOOLENS.

The conditions governing the men's wear market are unusually favorable, and the general consensus of opinion among the selling agents is that buyers are operating with a degree of freedom and confidence unlooked for in the early part of the season; the principal factor in creating this degree of activity is due to the advance of raw material and the firmness shown in the yarn market. It is maintained that duplicates will not be obtained at present prices, hence the volume of initial orders is materially larger than for several seasons heretofore.

Buyers also display considerable confidence in the continued general prosperity of the country at large, basing this confidence on the abundant crops which are now in prospect. It is true that there are weak spots in evidence in various parts of the country, such as labor strikes among the cotton operatives in the East and the packing houses and railroad operatives in the West; but the weak spots are many times counterbalanced and offset with the other conditions that are mainsprings and actual creators of prosperous conditions which affect the nation as a whole.

The low grade lines have been on exhibition for a month or more, and most of the buyers have completed their purchases on goods below a dollar. Speaking generally, quotations on the lower grades are from 2 1/2c. to 5c. higher than last season, and on a parity with the corresponding season a year ago; but there are isolated instances where this is not the case, such as the showing of piece dye mixtures by the American, in division B, Department 1. Style 6110 this year is quoted at 95c., against $1.00 last year. No. 6112, $1.07 1/2, last year $1.12 1/2; 6114, $1.20 as against $1.25 last year; 4012, Bannockburns, 87 1/2c., last year 90c.; twist mixtures $1.30, last year $1.37 1/2.

The principal feature of the demand has been the call for the so-called mercerized worsted fabrics and the extensive lines of such goods that are shown seem to possess intrinsic merit until the opinion formed among buyers is that this class of fabrics is likely to gain in favor as the season progresses; it is said that in many instances preference has been given to this fabric over wool goods at about the same figure. A trend of the demand is also for lighter weight material of the "tropical" variety, but with the exception of mercerized worsteds no one fabric has developed particular strength, although it is stated that the American have already sold the output of homespuns at or about 57 1/2c.

Corkscrew mixtures and plain colors are well to the fore both with the silk and mercerized stripes ranging in price from 85c. to $1.22 1/2. In the advances that have been made clays show the most general upward trend, the American having advanced Fulton clays 10c., while other lines of the same goods show an advance of 2 1/2 to 7 1/2c.

Cheviots and worsteds show an advance of 2 1/2 to 5c. on many numbers, while the balance are offered at last year's quotations.

The Gilbert serges were opened at an advance of 2 1/2c. The Shelburne Mills have opened five lines of mercerized worsteds, 85c., $1.05, $1.20, $1.22 1/2 and $1.25 1/2 respectively. These are all new lines and 60 inches wide.

Herbert Howard, agent for the Housatonic wool goods is showing lines at 75, 80, 85, 92 1/2, 97 1/2, $1.00 and $1.05.

Middleboro clays, shown by Geo. H. Austin, are open as follows: 12 ounce, 97 1/2c.; 14 ounce, $1.05; 16 ounce, $1.12 1/2; 18 ounce, $1.22 1/2; 20 ounce, $1.32 1/2; unfinished 12 oz., 97 1/2c.; 14 oz., $1.05; 16 oz., $1.15; 18 oz., $1.25; 20 oz., $1.35.

The Coronet Worsted Co. have opened their lines of mercerized worsteds, 60 inches wide, as follows: 9100, 12 to 13 oz., 77 1/2c.; 9200, 14 oz., 95c.; 9300, 13 1/2 to 14 oz., $1.02 1/2; also number 4192, blue serge, 12 oz., $1.05.

The through and through worsteds of the same company range from $1.17 1/2 to $1.47 1/2, and their manipulated cloths range

from $1.00 to $1.17 1/2. Holden & Leonard have opened their lines of rain cloths at 80c., 85c., $1.05, $1.25 and $1.75.

The Jamestown Worsted Mills have opened 11 oz. mercerized worsteds from 77 1/2c. to 95c.; 12 to 13 oz. worsted trouserings at $1.12 1/2; 12 to 13 oz. worsted suitings at $1.17 1/2, and 12 oz. cotton filled goods at 85c.

DRESS GOODS.

The situation in the dress goods market has materially improved and dress goods agents are fairly well satisfied with the outlook; duplicates have been received on many lines, but individual orders have been small. On certain lines of staple goods such as venetians and broadcloths, spring lines are in readiness. Orders have also been taken on sackings and tricots, but activity on spring business has not yet developed to any marked degree, although the importers have now opened their lines and some interesting and attractive novelties are being exhibited, no special movement in any class of fabric gives indications that any change will be made from such fabrics as have enjoyed popular favor during the season that has just passed. Among the lines just opened the most prominent are goods on the crepe order, such as silk and wool eoliennes and wool crepe de chines. Veilings and sheer worsted goods are shown in a wide variety of lines, but at the present writing it is too early to form a definite opinion as to what particular fabric will develop strength as a leader. Agents maintain that voiles and allied fabrics will maintain their popularity through the spring of 1905, and that the tendency is strongly in favor of plain goods.

Good duplicate business is being received on fine broadcloths for fall; there is also a fair request for coverts and venetians. Mannish effects for simple tailor made garments have been called for in considerable quantities. There also appears to be an increased demand for mohairs and Sicilians. Bradford manufacturers find some difficulty in meeting this request and advices just at hand from that market report that with a continuance of the present demand prices are likely to advance. Several new designs are being shown in this fabric, the most noteworthy being what is termed the "mannish cord stripes" on printed threads in grays and browns.

SILKS.

It was predicted several months ago that with the opening of the fall season a boom in silks would be under way, but although the silk market may be termed as being in a moderately healthy condition, no such happy condition has materialized. On the contrary, it is stated with some degree of authority that only 60 per cent. of the looms of the country are being operated.

It is true that many of the agents claim that they have done satisfactory business on fancies in taffetas and louisines for fall delivery. Neat effects in fancies have now ruled for some considerable time and there is an indication that the more progressive manufacturers are turning their attention to somewhat more elaborate designs. This can be said more particularly of the Liberty Silk Mills, who are showing some exquisite designs in printed warps among their new collections. An effort is being put forward to broaden the demand for other than plain taffetas and the staple peau de soies. It is conceded that unless a large volume of business is gathered in, the margin on staple taffetas will be insignificant. For that reason a fancy season is much more remunerative and when an opportunity is offered to produce such fabrics it is safe to say that full advantage is taken to produce such novelties as will meet with ready consumption.

Glace, or changeable taffetas, are being revived for such purposes as petticoats and linings for the sheer dress goods now in vogue. There is also continued request for crepe de chines and silks of the soft clinging variety, such as messalines. It is noteworthy that in view of the fact of a prosperous season the price level is now lower than for many years, due mainly to cost of raw material and also to the keen competition that manufacturers have to contend with.

COTTON GOODS.

Although the drop in cotton values has been severe, it is difficult to persuade some buyers that values have reached bottom lev-

els. It is true an increase in the volume of business followed, but it was far from being such as sellers considered they had a right to expect, and it is quite probable that the present low price level will not be maintained for the next 60 days as the market at the present writing is much firmer than it was a month ago. In the meantime, conditions have changed. The strike of the operatives at Fall River is an important factor. If the present situation remains unchanged for any length of time an upward trend may be confidently looked for.

So far as cotton dress goods are concerned predictions are made that the spring of 1905 is to be a sheer season, and that for such lines as printed organdies, printed crepes, printed tulles, light weight diaphanous materials will rule, while flowered effects will surely be the vogue. The demand for prints and ginghams for current use is somewhat sluggish and the reduction in price only proved a temporary stimulant.

LININGS.

The condition is still one of apathy and inactivity, with no material change looked for in the immediate future. Several of the converting houses bring out lines of lining silks which have met with immediate success, such as Burton Bros'. "Samson" silks. The Gilbert Manufacturing Company have recently produced the "radium" silk which has met with quick response from the trade. The lines of mercerized linings have been taken moderately, and the call from the clothiers for mohairs, alpacas and Italians has been strong. The request for silesias and percaline is normal at this time of the year, while paddings and canvas are firmer in price.

The so-called Turkey-red dyeing originated in India, was brought from Turkey to France and the method of operation published by that government in 1765.

The first calico printing factory on record was established at Richmond-on-Thames in 1676 by a French refugee. At first hand presses were employed and this method is still followed in Switzerland, chiefly for silk handkerchiefs with broad designs.

A VISIT TO ARMENTIERES.

Armentieres, June 15, 1904.

Thinking that a brief description of the industries at Armentieres would interest the readers of the Textile World Record I visited that place recently and found it to be a very charming city of 30,000 inhabitants, situated 11 miles from Lille on the river Lys, the water of which, so favorable for the retting of flax, has been a powerful factor in the industrial development of the city. Armentieres is the leading one of a group of manufacturing cities comprising, among others, Bailleul, Estaire, Halluin, Comines, and Houplines.

THE RIVER LYS.

Armentieres, however, is more than the queen of the Lys. Two British cities, Belfast and Dundee, surpass Armentieres in spinning and weaving of linen, hemp and jute, but the French city ranks first in the weaving of cloth (toile). Two panels in the public hall in the Armentieres Chamber of Commerce give the following statistics regarding the textile industry of the city in 1889 and 1900, the dates of the last two expositions at Paris:

	1889	1900
Power mills	52	54
Power looms	7400	8600
Hand loom mills	34	35
Hand looms	2700	2500
Flax yarn mills	12	13
Flax spindles	48000	52000
Cotton yarn mills		2
Cotton spindles		46500
Jute yarn mill		1
Jute spindles		3000
Bleacheries		40
Annual product	$18,000,000	$50,000,000

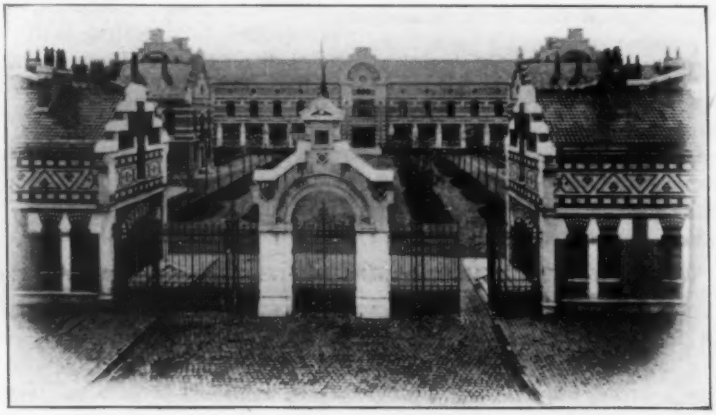
The value of the annual textile products of Armentieres mills in 1900 was more than one-half the quantity consumed in France. The

above tables show the steady development of the city.

The hand loom industry shows a marked decrease due to the competition of the power looms and the household industry is on the eve of complete disappearance. It is a long time since the weavers, working at home, carried on Saturday their weekly product to the place du Marche, and having disposed of their goods purchased yarn for the next week. This public sale of cloth was very curious. It began at the sound of the bell at Beffroi; ordinarily 300 pieces were exposed at a time. When sold the pieces were then taken to an old convent in the corner of the market place where they were measured and the buyers paid for the goods in demi-sous. The difference between the purchase price of the yarn and the selling price of the cloth constituted for each weaver his compensation for weaving the cloth. There were also some manufacturers who hired their work done in the homes of the workmen.

At the present time the production of plain cloth (toile) at Armentieres is estimated at 17,000 pieces of 164 yards each per week. This amount of cloth woven each week would reach from Armentieres to Marseilles and return and back again as far as Orleans. The annual production amounts to 850,000 pieces, consisting of unbleached, cream, bleached or dyed cloth, sack cloth, table cloth and mixed goods, linen and cotton fabrics. Armentieres supplies the French army and navy with cloth of this kind and during the Boer war the Armentieres mills furnished more than 100,000 pieces of cloth for tents for the English soldiers. The yarn for the Armentieres mills is spun in the city, at Lille and in Normandy. The goods are bleached in the bleacheries that have been constructed on the vast fields bordering the Lys.

The allied industries such as the manufacture of bobbins, shuttles, harnesses, etc., have likewise been established in Armentieres. Among other industries of the place are breweries, saw mills, etc.



THE NATIONAL PROFESSIONAL SCHOOL AT ARMENTIERES.

The most important institution in Armentieres is the National Professional School, established in 1887, and which has 400 pupils in attendance. It is a model of its kind and will stand a comparison with any of the technical schools of France and foreign countries.

THE FORGE.

It trains its scholars to become skilful and well informed artisans, and capable of earning their living to advantage upon leaving the school, thanks to the technical and practical instruction they receive in the following branches: Carpentry, forging, foundry work and weaving. During the four years' course the daily routine is as follows:

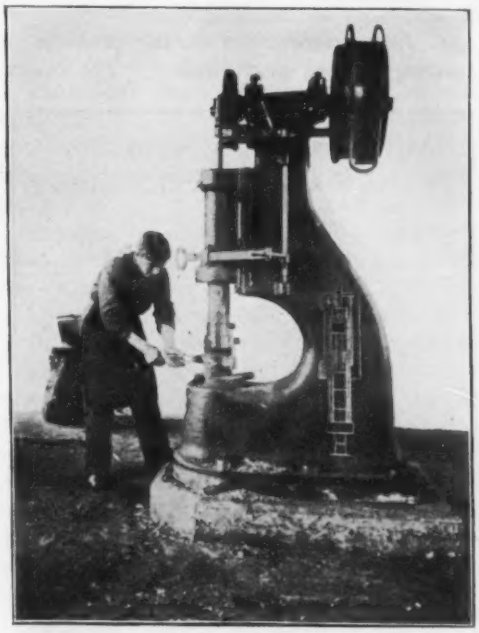
A. M.— 5.00 to 6.00, toilet.
6.00 to 7.00, study.
7.00 to 8.00, breakfast and recreation.
8.00 to 12.00, first year, class work; second, third and fourth years, class and shop work.
P. M.—12.00 to 1.30, dinner and recreation.
1.30 to 4.30, first year, shop work; second, third and fourth years, class work.
4.30 to 5.00, lunch and recreation.
5.00 to 6.00, class work.
6.00 to 8.00, study.
8.00 to 8.45, supper.
9.00 to bed.

Study and class work alternate with shop work in a very happy manner. The school grounds occupy an area of ten acres, of which

THE LAVATORY.

three acres are covered with buildings and the remainder with courts and gardens. The grounds and buildings are well arranged and the architecture is remarkably attractive. I have been able to visit the following departments: The power plant, where a Wheelock motor was found, the carpentry and pattern departments, molding shop, weave room, tool room, forge, and the electrical laboratory. Unfortunately the space at my command is unsufficient to give an adequate idea of the equipment and the various courses of instruction. The instruction is special, practical, and presents some very commendable innovations. One of these consists in an attachment to the frame of a machine of views and drawings showing the student every detail of the mechanism. Our illustration of the power hammer shows this method.

The equipment of the weaving department consists of a spooler, two warpers, one sizing



A POWER HAMMER.

machine, one winding machine, nine looms, including both harness and jacquard motions, and three Northrop looms. The sampling machines consist of eighteen small hand looms, one large hand loom with 1,200 needles and a number of other machines for experimental purposes. The method of instruction seems to be excellent and well followed up. The student mounts a short warp on a sample loom; he does all the work himself, including the dressing, drawing in, reeding, and mounting in the loom. When the warp is ready he weaves various designs, for which he has made his own drafts. He also makes a calculation to determine what he would have earned if he had been actually at work in the mill. When he has woven four or five inches of the cloth or enough to show

the pattern, he changes to a new design of which he makes a like quantity.

After this work he receives instruction in the analysis of cloth. The student dissects a fabric thread by thread, and determines the details of construction required for duplicating the goods. In this manner the student acquires very rapidly correct ideas of weaving and cloth structure.

At Armentieres the social problem is assuming a very grave aspect. The operatives there as well as throughout the surrounding country, to the number of about 20,000, made demands about a year ago for an increase of wages, which the employers refused to concede. As a consequence the labor troubles have been very serious, the disturbances reaching the proportions of riots in October, 1903. One building was burned and others completely sacked. The prospects at present are that these disturbances will be repeated. At the present time the operatives are discontented owing to various causes and it is said that they are planning to quit work. Troops have already arrived to meet emergencies. No one knows what the result of this conflict between employer and employee will be.

THE MARKET PLACE.

An important element—the perfection of machinery—promises to modify the present conditions and bring about surprises. I refer to the Northrop looms, of which one operative can tend sixteen. The manufacturers of Armentieres are not indifferent to such improvements in processes and recently a committee representing them visited the mills at Malaunay near Rouen where 400 Northrop looms were turning out 16,000 yards of cloth per day. The committee were conducted by M. Labbe, director of l'Ecole Nationale Professionnelle, and accompanied by M. James Dantzer, professor of weaving at the same school. The general introduction of the Northrop loom will probably lead to important modifications in the social and industrial conditions at Armentieres. We await that development and the enigma which it presents.

OLD HOME DAY AT EAST KILLINGLY.

Wednesday, July 27, was a gala day at East Killingly, Conn., among the mills of Chestnut Hill, whose story has so recently been told in the columns of the Textile World Record. It was "old home" day with former residents for, while the organization is known by the somewhat ponderous name of the Agent's, Superintendent's and Overseer's Association, the gathering is not as exclusive as the title would indicate and the day brings to us each year scores of those formerly employed in the mills who, with their families, thus celebrate the memory of earlier days. Old time friends come in from all the surrounding country and villages to greet them and give the cordial handshake and look once again into the dear faces of long ago, changed somewhat, it is true, by the ruthless hand of time, yet still aglow with love and loyalty for their old home and friends.

Despite the blackness of the early morn the day developed into one of supreme beauty and loveliness. The sun shone out in mild effulgence upon the glorious old hills, now clothed in living green, and upon

meadows which, with their newly sprouting aftermath, looked like recently shaven lawns, while the old stream, with glint of gold and silver, lay along through the valley like a pendant in emerald setting.

The gathering was upon the beautifully shaded green in front of the old church on the Hill, around which cluster the hallowed memories and associations of many successive generations. Twelve hundred or more people were present and the exercises were conducted under the direction of the president of the association, Ira J. Martin of Pawtucket, R. I. Many old friends came in from Providence, Pawtucket, Woonsocket and Whitinsville and from many other towns and villages along the Blackstone and Pawtuxet valleys, and from New Bedford, Warren, Norwich, Willimantic, Chicopee, Webster, Putnam, Danielson, Wauregan, Moosup, Williamsville, Attawaugan, Dayville, Ballouville, etc.

A very pleasing address of welcome was given by Mr. A. W. Greenslit, the veteran superintendent and only resident survivor of the ancient regime.

St. James Band, of Danielson, discoursed in harmonious strains music appropriate to the observance of the day, and the school girls sang songs of joyous welcome.

About 2 o'clock all sat down to a genuine Rhode Island "shore dinner," which proved to be by no means an unimportant feature of the occasion.

After the dinner Hon. Nelson W. Aldrich, United States Senator from Rhode Island, was enthusiastically received and gave a very pleasant old home address, reminiscent of his early days which were spent here. He gave pleasant memories of old time friends and days and paid a beautiful tribute to the stalwart virtues and moral and intellectual worth and stamina of the fathers.

There is nothing in our national life that, at present, is a more emphatic assertion of advancing civilization and progress than the increasing observance of these old home gatherings and the annual renewal of the ties of love and friendship for each other and for our old "home, sweet home." Amid all the industrial strife and commercial rivalry, and all the petty envyings and jealousies of every day life it is pleasant occasionally to turn the page and have revealed to us the better side of human nature, and get glimpses of the divine attributes that ever dwell within the human soul.

JAMES M. TUCKER.

THE SISAL HEMP INDUSTRY.

BY CHARLES RICHARDS DODGE.

The fiber from *Agave rigida*—varieties *elongata* and *sisalana*—is the sisal hemp of commerce, known in Mexico as *henequen*. The supply of this country is chiefly derived from Yucatan, though some fiber is received from the Bahamas, and trifling quantities from the Hawaiian Islands where the culture has recently been attempted.

The plant is a native of Yucatan, and has been introduced into many countries. Tracts of the plants are to be found in extreme southern Florida (introduced by Dr. Perrine about 1836). Importations have been made from time to time into the Island of Trinidad, the Windward and Leeward Islands, and others contiguous, Turks Islands, British Honduras and Central America generally, different localities in India, into the Australian colonies, South Africa, the west coast of Africa and Mauritius, etc., etc. Some very small plots are also to be found in Mexico proper.

The principal industry, however, is that of Yucatan which is a veritable gold mine to the country, particularly at this time when the fiber brings 10c. per pound in gold, millions of dollars being represented in the plantations of this region of which the city of Merida is the center. The writer knows of one plantation that was sold for two million dollars, and which paid for itself in two years.

The industry of the Bahamas dates back to the early nineties, when large plantations were established with young plants brought from Florida, though the sisal hemp, *agave*, was first brought to the Bahamas as early as 1845. The Hawaiian industry was started in 1893 with 20,000 plants purchased from a Florida nurseryman, and in 1902 the culture received quite an impetus by the establishment of a plantation on Kauai with 300,000

plants; smaller tracts have been set out on other islands. Samples of this fiber that I have seen show a hemp of superior quality.

Florida, though there is another plant found in a mild state in Florida, known as *Agave decipiens*, or the false sisal hemp plant, many

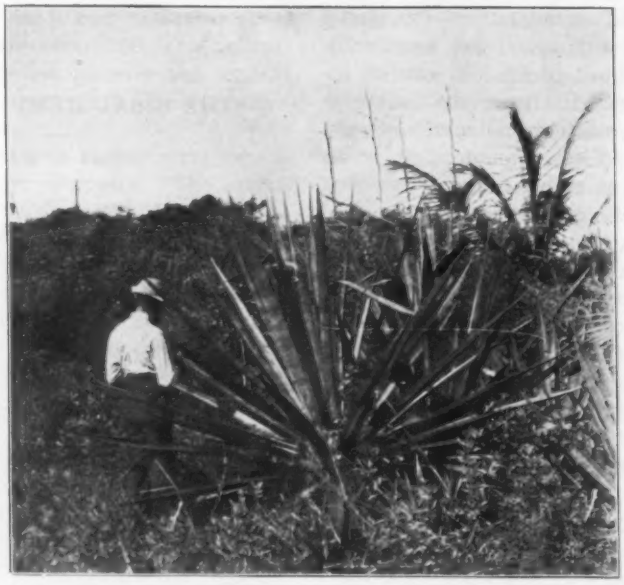


FIG. 1.

The Yucatan fiber is derived from the "spined" form of plant, *A rigida elongata*, young plants of which found their way to the Bahamas ten years or more ago. Fig. 1 is a

FIG. 2.

while the Bahamian and Hawaiian fiber is from the "smooth leaved," form *A rigida sisalana*. This latter form also grows in mature plant of the smooth leaved form as it grows in Florida, in a semi-wild state, descended from the old Perrine introduc-

tions of nearly 70 years ago. In the background of the picture will also be seen the poles or blossom stalks of plants about to flower, these sometimes being 20 feet high or more.

At the present time the industry of Yucatan has reached tremendous proportions, and its largest growth has taken place in comparatively recent years. In establishing plantations suckers or offshoots from the roots of old plants, from one to three years old, are used, and the age of the plantation is calculated from the time the young plants are set out. That is to say, a plantation five years old, at which age the first leaves are cut for fiber, is made up of plants which in reality may be eight years old. In many of the fields visited by the writer, in Yucatan, the "soil" was largely a rough surface of coral rock, Figure 2 showing admirably the rocky character of a majority of the hemp fields. In such situations the young plants are put out in crevices in the rock, and often it is necessary to prop them up by loose rock fragments until they take root. It is a fact that the more arid the condition of the hemp lands, the better the plants will thrive. *Au contraire*, too much moisture is very bad for the plants, and reduces the percentage of fiber.

In harvesting the leaves, for fiber, only the lower leaves are taken, there being a perfect system in the manner and time of cutting, only 12 to 15 leaves being taken from one plant annually, and these are not all cut at one time. The leaf is taken off close to the stem of the plant by means of a heavy-bladed instrument resembling a *machete*, each cutting leaving a scar; the stalk is lengthened each year, therefore, until in time the lower leaves may be produced at the height of a man's head from the ground. The young leaves are unfolded from the *cogolla* or central leaf spike, which is simply a cluster of unopened leaves in various stages of formation.

In Fig. 3 are shown a 10 or 12-year old plant, a bundle of leaves stripped of their spines and a Maya Indian laborer. (The negatives used in the illustrations for this article were made by the writer.) Fifty leaves comprise a bundle and represent an average weight of 75 to 100 pounds, which is about all a man can carry; the bundles are taken to lines of little narrow gauge railways, which extend all over the plantations, and are loaded upon low, flat cars, to be hauled by mules to the central factory, sometimes two miles away. On arrival the bundles are placed in huge piles, and eventually are raised to the machine platforms by endless belts, where they are opened as wanted. The machines are ponderous affairs embodying the raspadore principle of scraper wheels act-

FIG. 3.

ing against a wooden block or shoe. A machine is provided with a pair of endless grip chains, the scraper wheels being set at right angles, one on either side, the entire affair being automatic. The leaves are rapidly fed upon the chains, crosswise, and as they are gripped by one chain one end of the leaf passes, and is drawn into, the rapidly revolving wheel, which in an instant scrapes away everything but the fiber. As No. 2 chain grips the cleaned fiber, No. 1 releases the uncleaned portion, which is now presented to

the second wheel, when the cleaned mass passes on to be released altogether, and with-

See Fig. 4. The fiber is not washed, though sousing in water, and shaking off the moist-

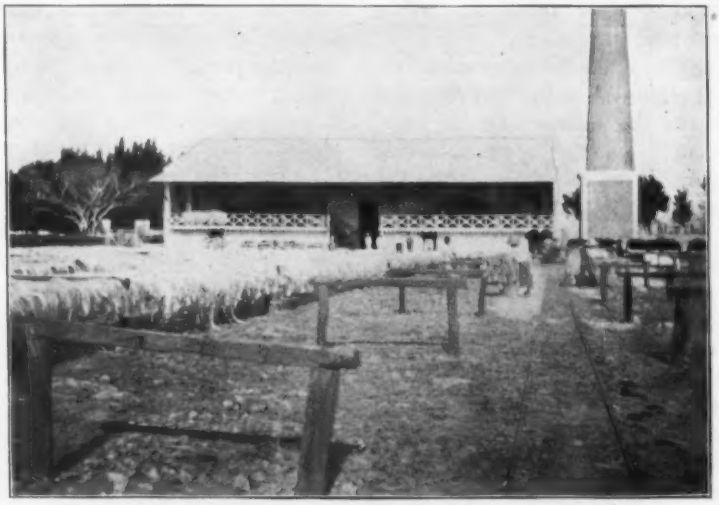


FIG. 4.

drawn by an Indian boy, who lays the wet fiber over a nearby rail.

Nothing now remains but to carry these masses of wet fiber to the dry yard, when,

ure makes a whiter fiber. After baling and marking the fiber becomes commercial sisal hemp.

As the quantity of fiber in a leaf amounts

A NATIVE HUT IN YUCATAN.

spread upon galvanized wire racks, raised a few feet from the ground, the fiber is soon ready to go to the storehouse to be baled.

to 3 1/2 to 5 per cent. only, there is a great deal of waste matter—largely water—which is lost. The water is allowed to run off.

while the pulp is loaded upon cars and run out to the dumping ground, no use yet being found for it, though anywhere else but in Mexico some valuable by-products would doubtless be secured. In the mass of pulp there is always quite a percentage of short and broken fiber, which is not recovered.

A leaf weighs from one to two pounds, and measures four to five feet in length. It is lance-shaped, four and one-half inches wide near the center and one-half inch thick. The fiber is the structural system of the leaf, the fibro-vascular bundles being surrounded by

TRAM CAR IN YUCATAN.

a pulpy mass of soft cellular tissue, the whole covered with a tough green epidermis. The action of scraping breaks down the softer tissues and releases the fibers, which are straight, smooth, lustrous and creamy white in color. Cleaning was formerly done by hand; then the rude machine known as the raspadore was used and finally the raspadore principle was evolved into the present machines, of which the Todd, the T. Albee Smith, the Prieto and the Villamore are types, the last two being the common forms seen in Yucatan today.

The baled fiber is transported to Progresso by rail, and from this port is shipped to many portions of the world, the United States being the largest purchaser. This country has taken, in a single year, fiber to the value of nearly $12,000,000. Among the hard fibers sisal hemp is second only to the Manila hemp produced in the Philippine Islands.

Bahama hemp comes to this market in small quantities. It is a little finer, and slightly whiter than the Yucatan. Formerly the bale was made up of small hanks of fiber packed something like French common hemp. The Hawaiian industry is so new that I can make no positive statements as to quantities coming to this market. Some has been shipped to San Francisco, however, the price of the fiber f. o. b. in Honolulu being quoted at eight cents.

Some Mexican fiber, from other species of Agaves than the *A. rigida*, has recently found its way to this market. It is not as strong as sisal, though it may be mixed with sisal, giving a product that while not quite so good, may be sold at a lower price.

In the course of my investigations in Yucatan I soon became aware of the fact that there was the greatest difference in the weight of leaves from different fields, and consequently corresponding differences in the percentages of fiber yielded. But, as a rule, the weights of leaves on the same plant, and upon areas of plants in the same field were found to vary but slightly. The Yucatecans do not

weigh the leaves, but count them, 1,000 leaves being said to produce two arobas, or about 50 pounds of fiber, the percentages of yield being set down from 3 1/2 to 5 per cent. My first endeavor, therefore, was to learn the average weight of 1,000 leaves. For this purpose mature leaves of plants of different ages, on the same farm and from different farms, were secured, ten average leaves in each instance being taken, and each lot carefully weighed, tagged and numbered. The different lots were then cleaned and the fiber from each lot extracted, tagged, dried and carefully weighed. In the following table eight lots are considered, the age of the plant, weight of ten leaves, fiber yield and percentages, being given:—

Lot.	Age.	Wt. 10 leaves.	Fibre Yield %.
No. 1.	5 yrs.	20 lbs.	3.27 per cent.
" 2.	10 "	10 "	5.57 "
" 3.	10 "	15½ "	5.92 "
" 4.	15 "	8¾ "	7.67 "
" 5.	15 "	14 "	5.64 "
" 6.	30 "	8 "	6.87 "
" 7.	32 "	15 "	5.88 "
" 8.	7 "	21¼ "	4.45 "

These figures are interesting as showing a difference in weight of single leaves, ranging from a little over 3/4 of a pound to over two pounds. Studying the percentages of yield of fiber, we find that Lot 1, 2 lb. leaves, on a basis of 2,000 lbs. of leaves, would give 65 lbs of dried fiber, while Lot 6, 10 leaves weighing but 8 pounds, would give at the rate of 137 pounds of fiber to the short ton of leaves. In actual practice, calculating on the basis of given weights of leaves, and percentages of fiber yielded, 100 pounds of the No. 6 lot would yield 13,070 pounds of fiber, while 200 tons of the No. 1 lot, leaves weighing more than double, would give 13,080 pounds, or only ten pounds more of fiber. In other words, one plantation owner would cut, bundle, transport to factory, and pass through the cleaning machines 100 tons more leaves than his neighbor and get, only ten pounds more fiber. So much for the 1,000-leaves, 2 arabas of fiber idea.

A STREET SCENE IN YUCATAN.

It is not my purpose to try to explain these differences here, as further investigations, extending through an entire season, might be required. That the weight of the leaves is largely dependent upon the amount of water they take up, may be set down as a fact, and this gives a partial clue to the solution of the problem, though it does not fully explain wide differences in weights in the same field.

Yucatan will always lead in the production of commercial sisal hemp, for a marked peculiarity of the plants grown in Yucatan is

shown in the fact that the blossoming (which destroys the life of the plant) is sometimes retarded twenty years or more after the first harvest of leaves, maturity being considered at the age of five years from date of transplanting. In Florida, in the Bahamas, and in parts of Mexico outside of Yucatan that I have visited, the "pole" or blossom stalk appears about seven years after planting, which, of course, fixes the life of the plant, as far as its availability for fiber yield is concerned, at about two or three years, when a new plantation must be established. In other words, after waiting five years for a plantation to mature, for a first crop of leaves, in two or three years the blossoming of the plants destroys the entire plantation. In Yucatan, where the plants do not blossom for fifteen and twenty years, or for even a longer period, the planter is assured that his plantation, once established, will yield annual crops for a generation. In point of fact, however, new plantations are set out every year, in order that the farm, as a whole, may always be in yield. It will be seen, therefore, what a tremendous advantage the Yucatan planter has over his rivals, outside of Yucatan, in this point alone. For this reason if for no other, sisal hemp culture along the Florida keys, where the plants grow to perfection, can never become a commercial industry.

Sisal hemp is used in this country for cordage, and largely for the manufacture of binding twine; rope is made from it for inland use mainly, while Manila hemp is employed for marine uses. In Mexico the fibre is employed for cordage, hammocks, bags, girdles, bridles, etc., though other fibers are employed for the same purposes. There is one cordage factory in Merida, though I understand that there is considerable American capital invested in the concern, the machinery, as well as the entire plant being up-to-date, a finished product resulting.

In 1645 Massachusetts enacted a law for the encouragement of the raising of sheep, and a few years later another was passed which required each family to spin three pounds of wool, cotton or flax per week for thirty weeks in the year.

THE CHEMNITZ HOSIERY SCHOOL.

For the instruction of the numerous skilled hands required to keep the wheels of the immense hosiery and glove industry of Chemnitz moving, a local organization, a number of years ago, established a knitting school, with its main branch devoted to the hosiery industry. The institution is a complete success, and annually turns out a large number of workmen, so-called "masters," who do much to maintain the high competitive ability of Chemnitz textiles.

The curriculum of this school is divided into a theoretical and practical part. The theoretical part includes instruction in comparative study of knitting and its related trades, such as plaiting, weaving, and knotting; hand knitting, including a study of the tools and machines required, the construction of these machines, and formation of the various kinds of hand-knit goods; machine knitting, including a study of English and French round knitting looms, formation of goods on the same, and a thorough study of the construction of knitting machines.

The practical part of the instruction includes active work upon hand looms for the manufacture of hosiery, gilets, underwear, gloves, and caps; work on petinet machines in making hosiery; table covers and shawls; work upon knitting machines of all kinds for the manufacture of hosiery, gloves and other knit goods; work on English looms for making hosiery, and on French looms for making goods out of which hosiery, underwear, shawls, and certain woven goods are afterwards made; work on Paget machines; work on sewing machines and spooling machines. Practical demonstrations by capable teachers enforce the work on the machines. Master workmen are always around to suggest, aid and criticise.

The curriculum, as briefly outlined above, is grouped for two systems of instruction, day and evening. The day school is in session during the most convenient hours, between 8 a. m. and 7 p. m., and continues for a period of one-half year. The evening school generally meets between 7 and 9 o'clock, and sometimes from 6 to 8 o'clock in the morning, and continues for a period of one year.

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The latter is designed especially for the accommodation of those whose days are occupied in earning a livelihood.

Theoretical instruction occupies a very subordinate position, twenty-six out of twenty-eight hours of study per week in the day course being devoted to practical studies. For the convenience of evening students who have varying amounts of time at their disposal, who desire additional skill in certain lines of work, or who wish to fill up a few breaches in their education, four different courses are arranged for the evening school: Course 1 provides for two hours per week of theoretical instruction for a period of six months, and two hours per week of practical instruction for a period of one year. Course 2, as well as courses 3 and 4, also provide for two hours of theoretical instruction per week for a period of six months; course 2 further provides for four hours of practical instruction; course 3 for six hours, and course 4 for eight hours of practical instruction for a period of one year each.

The tuition fee is $12 for the day course in case of citizens of Saxony, and $20 for citizens of other German states. The tuition fee in the evening school varies, according to the number of hours of practical instruction taken, and is $7, $11, $14 and $18 for courses 1, 2, 3 and 4 respectively. The fee must be paid in advance on entering the school.

Entrance requirements are: Citizenship in the German Empire, completion of the fourteenth year, and a good character.

DISSIMILAR DEVELOPMENT OF GERMAN TEXTILE SCHOOLS.

In the course of this paper an enumeration of all the leading textile schools of Germany was made. In addition to these there developed numerous smaller schools, which were scattered throughout the textile regions in the small towns. In the absence of a unified Government control, and of a centralized supervision and direction of the curriculums and the methods of instruction, each locality adhered to its own view of what constituted a good textile school. The result was the evolution, in Germany, of a widely dissimilar set of schools, each with its own peculiar characteristics. No comparison, no classification, no systematic arrangement of these institutions was possible as they stood. Moreover, each kingdom and principality had charge of its own schools, as is still the case today. The need of better Government control was apparent many years ago, and it was not long before action was taken to gather up the confused mass of schools and introduce order and system into them.

REORGANIZATION OF PRUSSIAN TEXTILE SCHOOLS.

Typical, and of the greatest importance in its influence upon German textile education, was the reorganization of the textile schools of Prussia undertaken in 1896. Interesting and instructive as this movement was, space does not permit of a detailed discussion of its progress. Only the main principles which governed in the reconstruction of the system will be given here. In the first place, the aims of the various textile schools were more clearly defined.

Instead of being a hodge-podge, the curriculums were so constructed as to confine instruction primarily to that branch of the textile industry which flourished in the locality in which the school was situated. Secondly, other branches of the industry might be taken up as far as the ability of the teachers, the time of the students, and the financial means of the school permitted.

Further, the equipment of the schoolrooms was considerably improved. Models, charts, machinery, drawings, and the numerous other essentials for efficient instruction were replaced, improved, or introduced. The duration of the courses in the various branches was also determined. This was absolutely necessary if any comparison of the work of the schools was to be made. Obviously the young German who studied spinning or finishing at a school offering a course of two years was much better equipped, and deserved a better position, than the fellow who attended a course of one year, or one-half a year, other things being equal.

Another valuable reform was the introduction of stringent graduating examinations conducted by a Government Commission. This removed the practice of granting a grad-

uation diploma without regard to any particular standard of knowledge, so that no employer could rely upon the possession of such proof of "graduation" by a student as representing that knowledge and understanding of a trade as he might require.

For the improvement of the quality of instruction provision was also made for the training of teachers, and their employment only where proper evidence was given of competence and of unmistakable familiarity with the technical elements involved in the trade.

Finally, in order to give the new regulations force, and insure their proper observance, provision was made for the supervision of the work of the school by capable men engaged in the textile business, and hence well qualified to judge of the practical value of the instruction offered in the schools.

CENTRAL TECHNICAL BUREAU FOR THE TEXTILE INDUSTRY.

To cap this reform, and to put the finishing touches to the splendid system of textile schools which was created through the reorganization sketched above, there developed, during the last seven years, another organization which has succeeded in binding together the well-organized individual schools that were the product of the reorganization of 1896, and has given to the whole system a unity such as springs from a general central supervision and control.

This organization is the Central Technical Bureau for the Textile Industry, and is known under that name since the year 1901. It is not the product of a day's legislation. Step by step it developed as the necessities of the time called for it. Today its benevolent influence is felt everywhere in the textile world. It stands as an able advance guard fighting its way onward to greater perfection in the education of young men for a career in the German textile industry. It has its headquarters in Berlin. It is an official body. Its functions are exercised under Government sanction, and with Government support. Its members are capable men of high rank. To all intents and purposes this council is the mouthpiece of the Government in making known the wishes, and exercising the control that is deemed necessary over the system of education in the textile industry.

The Central Technical Bureau for the Textile Industry grew out of the Institute for the Equipment of the Textile Schools, which was founded in 1896, and whose duty was to supply the textile schools with wood, wire, pasteboard, models, blackboards, maps, drawings, charts, and draftings of textile machinery, and samples of all kinds for study in patterning and designing. The leader of this organization was the director of the Berlin School of Weaving, who was given such assistants as the work demanded.

In 1896, when the textile schools were reorganized, this director was given additional functions, in the form of—(a) General supervision of all the Prussian textile schools; (b) the conduct of all business connected with the half-yearly examinations; (c) the supervision of the institutions for the education of teachers for the Prussian textile schools.

When, two years later, in 1898, the numerous schools for embroidery were established in Silesia for the promotion of the house industry, they were also placed under the supervision of the Berlin director. Not long after he was also given power—(a) To advise the Prussian Minister of Commerce and Industry on matters relating to textile education; (b) to undertake tours of inspection; (c) to formulate technical instruction, curriculums, examinations, etc., for the textile schools of Prussia. These duties soon grew too onerous and too manifold to permit of their discharge in connection with the regular work of the director, even though when assisted by capable subordinates.

In 1901, therefore, a special organization was established to take charge of all this work. Very aptly it was called the Central Technical Bureau for the Textile Industry. Upon the request of many leading German textile manufacturers and prominent public men this institution was also charged with the duty of conducting mechanical and chemical experiments in the field of textile technology. Certainly the task before the Bureau was no small one. Great, also, were the opportunities for a benevolent exercise of its powers in the interests of the German tex-

tile industry. Judging from all reports that have come to the attention of the writer this organization has fully realized all that was expected from its work. Today it stands as the most powerful guardian of the welfare of one of Germany's most important and most vital industries, for the textile industry is one of the great pillars on which rests the prosperity of the German people.

RAMIE.

BY THOMAS BARRACLOUGH.

(Journal of Society of Arts.)

The knowledge available respecting the choice of climate and of soil, also concerning the cultivation of the ramie plant, the decortication of the green stems, the degumming and softening of the fibre, the preparation, combing and spinning of the yarn may now justly be termed up to date.

A large number of persons and companies have for many years been making experiments, conducted with more or less knowledge and intelligence, and generally with considerable loss of money and time; the results taken as a whole have, however, shown distinct progress, and have led to a great increase of skill and experience in the practical cultivation, treatment, and manufacture of the fibre in all its branches.

It is now a feasible matter to engage successfully in the cultivation of ramie, in the degumming, spinning, and weaving of ramie commercially, without running the risks of the losses of money and time which were inevitable say 10 to 30 years back. Consequently this fibre, the splendid qualities of which have been in a large degree one cause of its slow progress is now increasingly available for a great variety of purposes.

It has been amusing to me during the last two or three years, to receive communications and visits from many would-be inventors, offering for sale newly invented machines for decorticating ramie, and newly invented processes for degumming and softening ramie, who were mostly under the impression that good decorticating machines and practical degumming and softening processes were non-existent. Such inventors are generally of opinion that the main reason for the slow progress of ramie is to be found in the want of knowledge how to treat it.

CULTIVATION.

It is now as easy to choose plots of land for successfully growing ramie, as it is to choose suitable plots for growing cotton, hemp, or flax. The nature of the climate and of the soil, the surrounding conditions, the supply and degree of moisture, etc., favorable to the growth, are now well known. Likewise, the mode of forming successful nurseries for the young plants, the system and conditions of planting, the treatment of the plants, the propagation, the cutting of the stems, etc., present no difficulties.

DECORTICATION.

The interior of the green stems consists, in a great measure, of woody pith, called in the trade "shieve." This has to be removed by decortication, and also the outer skin of the stems generally termed "pelicule." This skin must be removed in the green state from the underlying fibres, because if allowed to dry it becomes brown and sticks with extraordinary tenacity, by means of a special gum, to the fibres.

Ramie, partially or imperfectly decorticated, needs not only a longer, but also a stronger process of degumming, involving extra cost, extra loss of weight in degumming, and a deterioration in the quality of the filasse. A good decorticating machine must therefore do its work efficiently, give a good production, and be capable of working by means of native labor. Fibre of good quality when decorticated, contains about thirty per cent. of its weight in gum, to be afterwards removed in the degumming process.

The cultivation of ramie has been undoubtedly seriously retarded for many years past through the defective construction of the decorticating machines on the market, and their unpractical working. Some of them performed the process imperfectly; some wasted a great deal of the fibre by breaking and bruising it; others produced too small a quantity, etc.

While I am not able to say that perfection

in decortication has been reached, I am able to state that a few decorticating machines are proving successful, notably the last one which the late Mr. Faure invented. To him all growers of ramie are much indebted, because as soon as he realized the great importance of having good decorticators for ramie, he, like a practical engineer, not only set to work to invent one, but he also started a plantation of ramie on his country estate near Limoges in France. He invented several machines, each one better than the previous one, and was able to test them practically with his own green stems; he gained several gold medals, and his latest improved machine is admitted to be the most successful one now at work.

DEGUMMING.

An opinion seems to be prevalent that the process of degumming is still in its infancy, and capable of great improvements. Such is not the case. The principle of freeing ramie fibre from the gum is well understood. Recent improvements have been mainly directed with great success toward shortening and improving the process and reducing the cost. Good quality ramie can now be degummed at a cost of 2 1/2 cents per pound, calculated on the dry weight of the degummed filasse. Inferior qualities of fibre cost 3 to 3 1/2 cents per pound. These figures cover labor, materials, steam, water, expenses, etc.

Some growers of the fibre think it is incumbent on them also to degum the fibre. This is, however, a great mistake, because ramie spinners insist on degumming all their fibre themselves, so as to avoid serious losses which might easily be incurred by using fibre degummed by others by means of chemicals and processes deleterious to the fibres. There is no market for the sale of degummed fibre.

Successful degumming involves not merely speed and economy in the process, but also the retention of the leading qualities of ramie. Its marvelous strength must not be impaired. Its silk-like lustre must not be affected. Its softness must be retained, likewise its efficiency for passing very quickly and easily, with the least possible waste, through the various processes and machines. Its extraordinary wearing qualities and its freedom from rotting when left in water must also be preserved.

Formerly the fibre was not sorted previous to degumming. The consequence was that qualities needing 12 hours for the degumming process were mixed up with qualities requiring 18 hours' treatment, and with both these were mixed up qualities requiring even 48 hours' treatment. Thus, in treating all together, some portions were overdone, others underdone, and the result disastrous in many ways.

In modern ramie works the fibre is always very carefully assorted, green and white separated, also different qualities and lengths. In this way each lot can receive the degumming and softening treatment specially adapted to its requirement, with the result that the best qualities of filasse obtainable from the raw material are produced and made ready for passing into the machines.

PREPARING, COMBING AND SPINNING.

New machines have been constructed for these processes embodying many special adaptations to the peculiarities of the fibre. The consequence is that it is possible to start ramie spinning mills with the same ease and prospect of success with which cotton and flax mills are started. The combing operations are of primary importance, because of the great diversity in the lengths of the fibre.

The term "long fibre" includes fibre from 8 to 14 inches long; the term "medium fibre" includes fibre from 4 to 8 inches long; the term "short fibre" includes fibre from 1 1/2 to 4 inches long; the term "noils" includes the shortest fibre, say, from 1/2 to 1 1/2 inches long.

This diversity in the lengths of the fibre involves the necessity of having drawing frames, roving frames, and spinning machines specially constructed for the various lengths of fibre, and it is this skilful adaptation of the construction of the machines to the various kinds and lengths of fibre which is one of the main causes of the great progress made in recent years.

Instead of using, as was formerly the case, machines constructed for worsted, for flax, or for silk waste, specially constructed ramie machines are now in use, with the result that

both as regards quality, quantity, and cost of production, the modern machines have put the old experimental machines entirely in the shade.

The noils, that is to say, the short fibres resulting from the combing process and amounting to about 30 per cent. of the weight of the filasse, are very much sought after, not only for spinning, but also for mixing with short wool used in the manufacture of ordinary woolen cloths. They now fetch more than three times the price they formerly did. At one time it was difficult to obtain 4 cents per pound for the noils. They now sell freely at 14 cents per pound, which is considerably more than the cost price of the filasse.

The waste in the preparing and spinning operations has through the many improvements introduced in the treatment and in the machinery, been reduced to a minimum. It is now not one-third of what it used to be, and this waste sells for the same price as the noils.

There seems to be good evidence that an important boom is at hand in connection with this fibre. After long years of waiting the success is in sight, and the cause is due to the fact that ramie has at last been enabled to prove itself a marvelous fibre commercially.

It is being used in the manufacture of a great many kinds of textile goods for a great variety of purposes, such as ladies' dress goods, muslins, upholstery goods, napery (tablecloths, napkins, sheets, etc.), damasks, laces, hosiery, ribbons, scarves, trimmings, smallwares, mosquito nets, fishing nets and lines, shoe thread, boot laces, surgical bandages, lint, fire-engine hose, sailcloth, etc. It is also now being largely used in trades for which up till quite recently it was not supposed to be adaptable. There are now in Germany alone 11 manufacturers of gas light mantles, all using ramie yarn which has shown itself by far the best yarn for the purpose. For gentlemen's underclothing and hosiery, ramie yarns have proved themselves to be of immense value in the manufacture of these goods; wherever introduced their use spreads rapidly.

For mixing with worsted, with silk waste, etc., ramie is now being very extensively used. The ramie, in the form of sliver, is mixed with slivers of the other materials, and drawn and roved. The yarns spun therefrom have developed qualities which the unmixed materials did not possess, and here let it be said that ramie is not an adulterant for these other textiles. It imparts qualities to the mixtures which no other fibre can impart. For instance, yarns composed of silk-waste and ramie fetch a higher price than if composed of silk-waste only, because the ramie imparts to the silk a wonderful strength and quality, enabling it to be spun exceedingly fine, and the lustre of the ramie combines well with the lustre of the silk.

Fancy goods made from a mixture of long-combed wool and ramie possess qualities which are rendering them increasingly fashionable in the market.

We have thus under our consideration in ramie—

A splendid fibre whose qualities place it at the head of all fibres.

A fibre obtainable and salable in any desired quantity.

A fibre capable of being manufactured into an immense variety of goods with great success.

A fibre the yarns of which can be spun to any degree of fineness and dyed to any color. They are in such immense demand by manufacturers, that spinners cannot keep pace with the demand.

A fibre in ever-increasing favor with the public, with the prospect of its becoming the centre of a very large and widespread boom.

Mill Flooring. J. Percy Day, London, is introducing into the English market the Euboeolith flooring, which is said to be very satisfactory for textile mills.

Flat Stripping Device for Cards. G. Kearton, Southport, England, is placing on the market an improved device for cleaning the top flats of cotton cards. The comb and brush are dispensed with and the flats are cleaned by a vibrating stripper covered with card clothing. It is claimed that not only is the possibility of damage to the card clothing obviated, but the flats are cleaned better than by the methods now employed.

WHY TEXTILE GOODS SHOULD BE ADVERTISED.

VI.

This is the sixth of a series of papers upon textile advertising by Thomas Balmer, advertising manager of the three publications of the Butterick Publishing Company—The Delineator, The Designer, and the New Idea.

1. Necessity and possibilities of textile advertising.
2. Naming and trade-marking textile goods.
3. Planning the advertising campaign.
4. General publicity and work upon dealers.
5. Actual experience of manufacturers whose advertising has been successful.
6. Brief comment upon six different lines which will then be discussed, one at a time, in the six following papers based upon actual statistics collected at an expense of thousands of dollars and an equal value for the time demanded for their collection.

All good and successful advertising is based upon a foundation of facts. There is very little theory and no hot air about advertising done as it should be.

I have made a collection of statistics in regard to the demand and distribution of leading textiles, which I think forms the most impressive object lesson ever presented to a manufacturer.

I have selected six leading lines of textiles, each of which I have made the subject of a separate investigation.

These six are:

Muslins.
Silks.
Dress Goods.
Underwear.
Hosiery.
Blankets.

By "dress goods" I mean both woolen and cotton dress goods.

Underwear will include all knitted underwear, such as union suits and two-piece suits for men, women and children.

Hosiery will cover men's, women's and children's.

Each of these six subjects will be made the basis of a separate article in this series.

The way I have conducted my investigations is as follows:

I have selected ten leading department stores in New York and ten leading department stores in Chicago.

The lady, trained in knowledge of what was required, made it her business to find out what ten shoppers inquired for at the Muslin Department of each of these twenty stores. She would get a record of what was asked for and what took place at the counter in one store by three different shoppers for one day, and she would keep making her visits there until she had finally made ten investigations so as to strike a fair average. Note was taken of what the shopper asked for, for what purpose she wanted it, why she asked for it, what she finally bought, why the sales-girl sold that, or why she didn't buy in case she didn't.

This same investigation was applied to silks, dress goods, underwear, hosiery and blankets.

The array of facts thus secured forms one of the most monumental tributes to the necessity of advertising in these lines that has ever been gathered together.

It has cost me a great deal of money to get these facts together, and I propose to present them in the pages of the Textile World Record to the textile manufacturers of the country.

I have selected only the six lines mentioned because they are six leading lines, because I could get the facts for these lines, and because it was necessary to limit this discussion, but equally momentous facts could be obtained for any textile line that is now sold in the retail stores.

The general lessons to be learned from this array of statistics all point to the fact that the shopper asks for goods by name, whenever she knows the name of any goods that she considers reliable for any cause, either because she knows the name of the manufacturer, has heard of the brand, knows the label, has used the goods before, or been recommended to use them by somebody in whom she has confidence. In every case the shopper used what previous knowledge she had to get the goods she wanted. Without advertising, but simply through other incidental means, the name or some fact about the article had been stamped upon her mind, and in her way, as far as possible, she tried to indicate to the sales-girl what she wanted. Sometimes she gave a description of the purpose for which she wanted it. Sometimes she

remembered the trade mark or label. Sometimes she was utterly at sea, and the time of both the sales-girl and the shopper was consumed until the shopper could get what she wanted.

Here is where the textile manufacturers are losing their great opportunity.

The woman wants to be told something definite about a definite, good article, so that she may go into a store and ask for it by name, get exactly what she asks for, know that she is getting it, and know what it is and knows how to know—the advertising tells her that.

The New England States are covered with mills turning out the finest products of muslin looms the world has ever seen. The capitalization of these mills runs from hundreds of thousands to several million dollars. They are controlled by men of unusual sagacity and shrewdness in manufacturing lines. They have built up a market for their products by means of careful, conscientious manufacturing and the distribution of goods through the ordinary, legitimate channels of trade.

Nevertheless, among these various products there is great room for discrimination.

One thing is lacking to complete the success of these muslin manufacturers, and that is a closer relation between the consumer, the actual user of the muslins, and the manufacturer who makes them, and what is true of muslins is true of silks, dress goods, underwear, hosiery and blankets and the entire list of manufactured textile goods.

Manufacturers of this class are conservative. They have been trained in a school which does not recognize the relation between their business and advertising.

Textile industries are among the oldest in the country. They are more deeply intrenched in their conservatism, and until very recently they have shown no signs of awakening to the great commercial revolution that is sweeping over the civilized world in new selling methods.

One by one the great staples of human consumption are being brought into the limelight of modern advertising. The first to recognize these possibilities were the food stuffs—the by-products of packing houses, crackers, biscuits, breakfast foods, coffees and sugars. About the same time came soaps, toilet and scouring, washing powders and other small articles of household use. Then came manufactured clothing to some extent, and also some of the staple articles used in the construction of dwelling houses. The possibilities of these lines are only beginning to be realized.

Meanwhile no one department of manufacturers in this country has the importance or the volume of the textile industries. No one is so susceptible of good advertising because the textile line of goods appeals almost exclusively to women, and women are almost exclusively the buyers through advertising, and no one has such a small amount of advertising in proportion. Never before in the history of advertising has the opportunity been so ripe for successful advertising for the reason that more and more women are being educated every day to believe in advertising. That is why the advertisers should be careful of what class of mediums they get into, and only go into those that will not destroy the growth of this by advertising in mediums that are not brought to her notice or into the homes. That is why one line after another has been found profitable to advertise; because when a woman is accustomed to buying one line of goods through advertising and is pleased with them, they are glad to buy another line of goods where heretofore they have not thought they could buy unless they personally inspected the goods over the counters and talked with the salesmen.

The first requisite is an advertising medium which reaches just the right sort of people.

In the Butterick Trio, consisting of the three publications, The Delineator, The Designer and The New Idea, are three papers which not only go to the women, and especially the women who make up the entire body of shoppers of this country, but they go to women who are especially interested in dress.

These three publications pay especial attention to the making of clothes. Therefore, their readers are the ones who buy the greatest quantity of textile goods in the unmade-up form. They are the women who should be taught to discriminate and name the mus-

lins, silks and dress goods that they require. The advertising in these papers runs side by side with articles written by the best authorities upon every department of woman's dress. There is the closest possible cohesion between the reading matter and textile advertising.

The Butterick Trio are not the only women's papers of this class, but they are the leading papers, and they are especially appropriators of the textile manufacturer's problem, because they are sold over the counters of nearly 15,000 of the leading dry goods dealers and department stores in the United States, which when the advertisement is adequate practically makes The Butterick Trio as important to inform the dealer, as it is to inform his customer who buys from him.

I have said that the first requisite of successful textile advertising is proper advertising mediums, but it is only the first. The entire structure of magazine advertising is only one part of a successful advertising campaign, textile or otherwise. The magazine advertising is the part that is seen, but it bears the same relation to the unseen, working part that the visible portions of an Atlantic liner—the decks, funnels and rigging—do to the parts below the water-line—the boilers, propeller and steering apparatus.

The mistake a great many advertisers make—especially new advertisers, and more especially advertisers in a new line—is to leave it all to the magazine advertising. Magazine advertising is successful generally in proportion as it is followed up by adequate printed matter. Even when a manufacturer's goods are in all the stores and trade-marked, it is necessary to let the dealers know about the advertising plans and the fact that a new demand is being created through the women's papers. It is necessary to have attractive printed matter to send to the numerous inquirers who will write direct to the manufacturer. It is necessary to have a department which will bring the store which sells your goods, and the woman who is seeking them, in touch with each other, so as to leave a feeling of good will toward you and your goods in the minds of both.

There are hundreds of thousands of department stores, dry goods, notion and general stores in this country, any one of which could be a distributer of your goods.

The real province of magazine advertising is to enlarge the number of stores which carry your goods and increase sales in those that already sell them and, therefore, increase your annual output.

The distribution of your goods through the stores can be attended to by the jobber and wholesaler in the regular course of trade, but the demand for them must come from the consumer, through the retailer and jobber, to you. You can never force business the other way.

To manufacture the best sort of goods you know how to make is one method of building up a big trade. The trade you now have was secured in this way, but at a time when selling conditions were different, and in face of competition, and in face of present conditions, you cannot force your business much farther along these lines, and you never can bring it to its fullest volume by any method so illogical as working backwards through the commission man and jobber.

If, however, you can teach 100,000 more women to ask for your goods by name, or to look for your trade-mark instead of taking any goods of the same kind offered by the salesman, you bring a new and peaceful leverage to bear upon the buyers of numerous retail stores. These buyers in turn have their effect upon the jobbers, which means increased orders for you in the future.

Nor is this all.

Your advertising is not for any one season or any one year's business. A trade-mark once standardized and established will be the best asset you can have. Other men may make goods equal or superior to yours, but when you have taught people to prefer your goods, and to know what your name and trade-mark stand for, no one can take that trade away from you, because no one else can manufacture goods under that name and trade-mark. This is an asset which keeps right on growing with your advertising, so that it becomes more and more profitable to you every year.

It is to help you to see such possibilities as these for your business that I have prepared the array of statistics which I am going

to show you in successive papers. I want you to read carefully all six of these papers, but especially the one that treats of goods of the kind that you manufacture.

Realize, as you read, that these ten shoppers at each one of these stores made their inquiries probably the first half-hour after the store opened for business, that during the day there were probably ten times as many as these for each one of these stores, and that these stores are open for business every day in the year, and that there are thousands of other stores just like them, though perhaps not so large, scattered all over the United States.

In other words, I want you to realize what a tremendous purchasing power that is of the women of this country—thirty million of them, a large portion of them going to some dry goods or department store every day of the year to find just such goods as you make.

I want you to realize that by taking a proper space (and I am prepared to explain just what a proper space is to anyone interested in the subject) in such a group of magazines as the Butterick Trio, you can reach every single month in the year six million interested women. Six million is only one-fifth of the number of women in the country who ever buy at stores of this kind.

These thirty million women are your real market, your real public, the ones to whom you should talk, the ones who decide whether or not you will be successful in the future, just as they have decided that you should be successful in the past.

All the goods you have sold in this country have been sold to these women. All the goods you will ever sell in this country in the future must be sold to these women. No combination of manufacturer, commission man, jobber, drummer and dealer can make your goods successful without the consent of this woman public.

And you can talk to them at a price so cheap as compared with every other method you have of selling goods, that it seems almost unnecessary to demonstrate the fact.

There is no theory about the facts set down in the succeeding papers. They are a bare record of what actually happened in leading stores in this country. They show how shoppers ask for goods and just what chance they have of getting them. They show just how set they are in their first choice, or how easily they can be persuaded. They show just which goods are established on their merits. They show just how much influence the salesman or saleswoman has in making or marring a sale. They show that any manufacturer who has stamped the name and quality of his goods upon the buying public has a chance of getting them sold in most instances so certain that he cannot refuse to recognize the importance of this if he desires to be successful.

I have had the results of these investigations carefully analyzed by an expert statistician. I have set down very simply the net results without comment. Tables speak for themselves. No manufacturer who reads them can ignore the facts. All I ask of you is that you do read them and consider them.

THOMAS BALMER.

The World's Cotton Spindles.

The following table, prepared by the English Board of Trade from different official and unofficial sources, gives a rough estimate of the total number of spindles (000s omitted) in use in the cotton spinning industry of the world at decennial periods since 1870 and in 1903:

	1870	1880	1890	1900	1903
United Kingdom:	37,700	44,500	44,500	46,200	47,900
Continent of Europe:	13,000	21,000	26,000	32,000	33,000
United States:	7,100	10,600	14,200	19,000	22,200
Other countries:	....	2,000	4,000	7,000	7,500
Approx. total:	57,800	78,100	88,700	104,200	110,600

The Chinese are the oldest beadmakers in the world. They have made beads so long that even their historians do not mention a time when the industry was not ancient, and today they do the work just as their forefathers did and the styles are exactly the same.

TEXTILE PROCESSES.

EDITED BY E. A. POSSELT.

OUR TEXTILE DESIGN SCHOOL.

Lesson 7.—Steeped Twills or Diagonals of 70° Obtained from 45° Twills.

In these weaves, as to a certain extent indicated by the above heading, the direction of the twill, i.e., the diagonal line, is arranged to run more oblique than in the regular diagonal or 63 degree twills as explained in the May issue of this journal. The new diagonal or steeped twill is obtained from the regular twill by means of: "*take one warp thread and miss two warp threads of the regular twill*" for the new weave.

This drafting will readily indicate that in connection with the proper multiple or foundation weave, a considerable decrease in the number of harnesses required for the new weave takes place, since in this instance, for example, a 12 harness foundation weave ($12 \div 3 = 4$) requires only 4 harness for the new weave. In the same manner a 14 harness foundation weave will result in a new weave repeating on 5 harness; an 18 harness foundation weave in a 6 harness, etc., etc.

Foundation weaves in which the repeat is not divisible by 3, will not reduce the number of harnesses for the new weave, and for which reason an 8 harness foundation weave will result in a new weave, repeating on 8 harness; and in the same manner a 10 harness foundation weave in a new weave repeating on 10 harnesses; an 11 harness foundation weave in a new weave repeating on 11 harnesses, etc., etc.

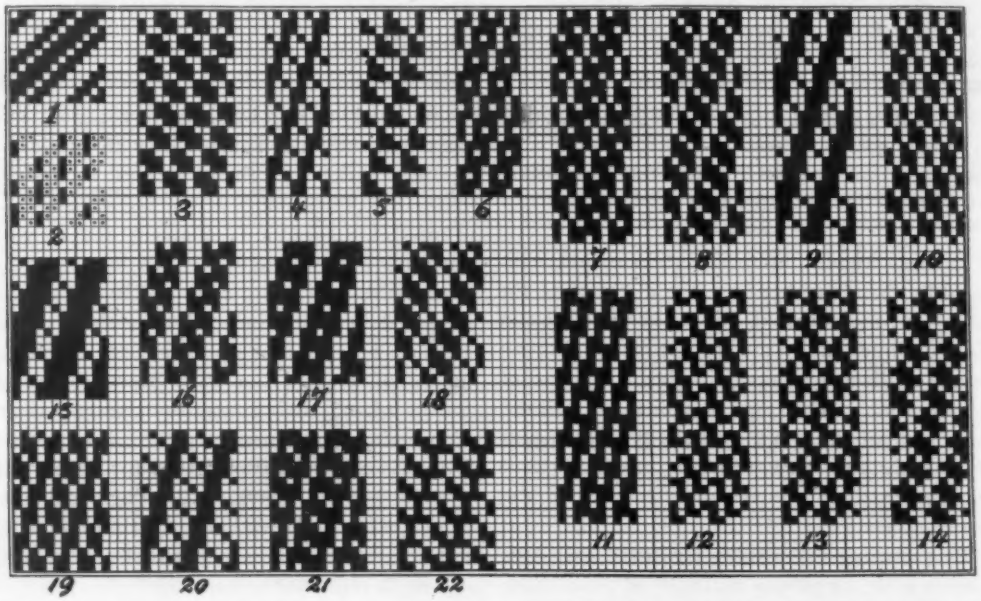
Having given an explanation of the foundation and the repeat of these steep twills, we next will explain their construction by means of practical examples, i.e., a collection of weaves of the greatest of value to any designer or manufacturer, since these weaves are specimens of practical work, and under all circumstances will come handy to him in his daily vocation, again they will show the student how to produce an endless variety of these weaves in a similar manner. Their construction is best shown by means of diagrams 1, 2 and 3 and of which diagram 1 shows the $^{3}_{1}{}^{2}_{3}{}^{2}_{1}$ 12 harness 45 degree twill. Diagram 2 shows the same weave executed in two kinds of type thus: Warp threads 1, 4, 7 and 10 being represented by means of ■, and the other warp threads by means of ⊡; their proportion being as 1 : 2. Combining only those warp threads as shown in Diagram 2 by means of ■ type for a weave, results in the new weave, i.e., 70 degrees diagonal or steeped twill shown in Fig. 3, the same repeating on 4×12. This shows that only a reduction with reference to harnesses takes place, the repeat of the foundation twill, filling ways, remaining undisturbed.

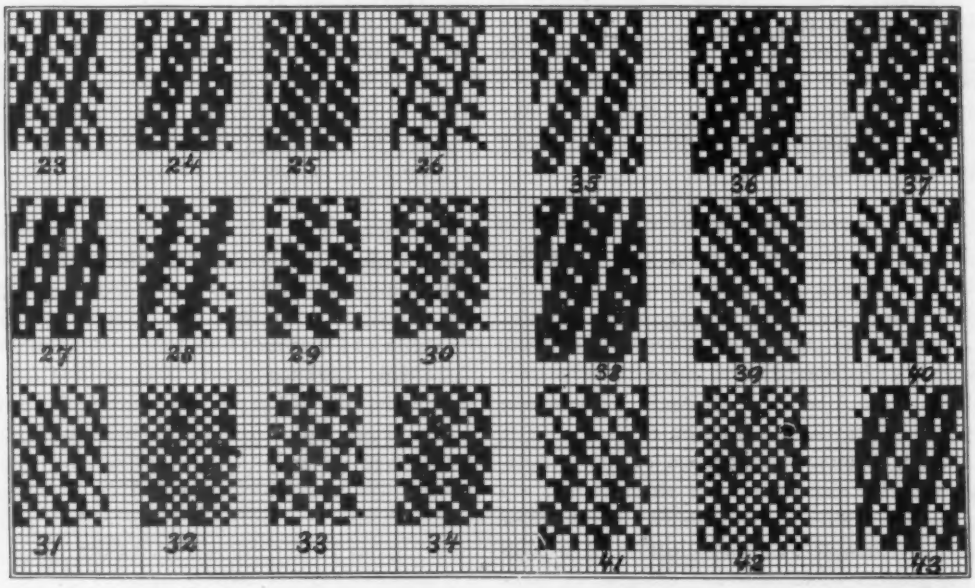
Weaves Figs. 4, 5 and 6 show three more examples of such steep twills, obtained from 12 harness regular twills, weave Fig. 4 having for its foundation the $^{5}_{3}{}^{1}_{3}$ 12 harness 45 degrees twill, weave Fig. 5 having for its foundation the $^{3}_{3}{}^{1}_{2}{}^{2}_{1}$ 12 harness 45 degrees twill, and weave Fig. 6 calls for the $^{4}_{3}{}^{4}_{1}$ 12 harness 45 degrees twill for its foundation.

Weaves Figs. 7, 8, 9, 10, 11, 12, 13 and 14 show eight examples of these steep twills, obtained from 15 harness regular twills, and for which reason this collection of 8 steep twills repeats on ($15 \div 3 = 5$) 5 harness $\times$ 15 picks.

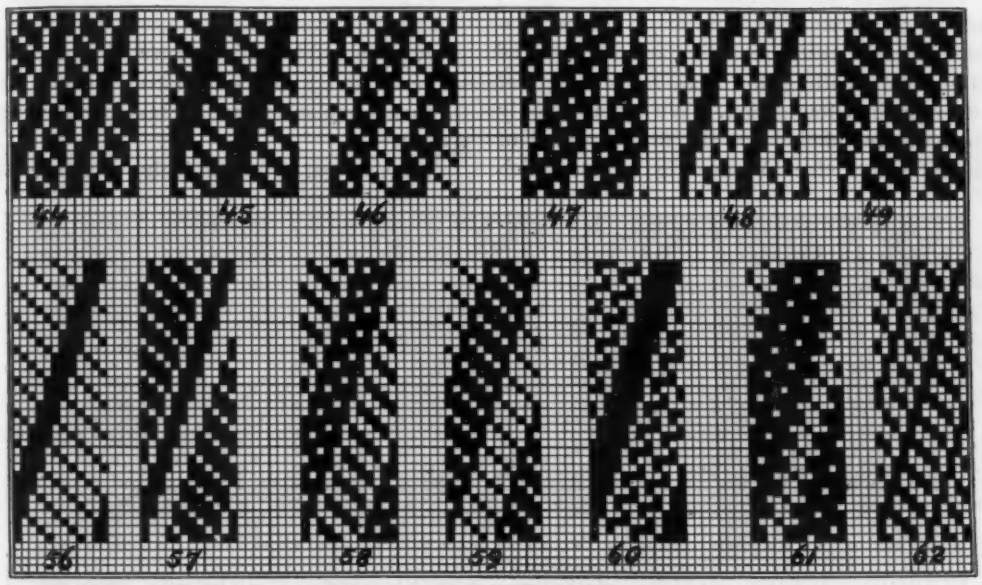
In this instance weave Fig. 7 has for its foundation the $^{3}_{1}{}^{4}_{1}{}^{3}_{3}$ 15 harness regular twill; weave Fig. 8 the $^{3}_{1}{}^{3}_{1}{}^{3}_{4}$ 15 harness regular twill; weave Fig. 9 the $^{5}_{3}{}^{1}_{3}$ 15 harness regular twill; weave Fig. 10 the $^{3}_{1}{}^{3}_{3}{}^{2}_{3}$ 15 harness regular twill; weave Fig. 11 the $^{5}_{3}{}^{5}_{3}$ 15 harness regular twill; weave Fig. 12 the $^{3}_{2}{}^{1}_{1}{}^{1}_{2}{}^{3}_{2}$ 15 harness regular twill; weave Fig. 13 the $^{3}_{1}{}^{1}_{3}{}^{1}_{1}{}^{3}_{2}$ 15 harness regular twill; and weave Fig. 14 the $^{3}_{1}{}^{1}_{4}{}^{1}_{1}{}^{3}_{1}$ 12 harness regular twill.

Weaves Figs. 15 to and inclusive weave Fig. 34, show diagonals of 70 degrees grading, repeating on 6 warp threads and 18 picks, and when naturally each and every one of these weaves calls for its foundation for its corresponding 18 harness regular twill. We have omitted to quote the foundation of these 20 new weaves for the fact that they would call for a considerable amount of type setting; only take up space, and that by means of previously quoted examples, the student cannot help but get the proper foundation weave, i.e., regular



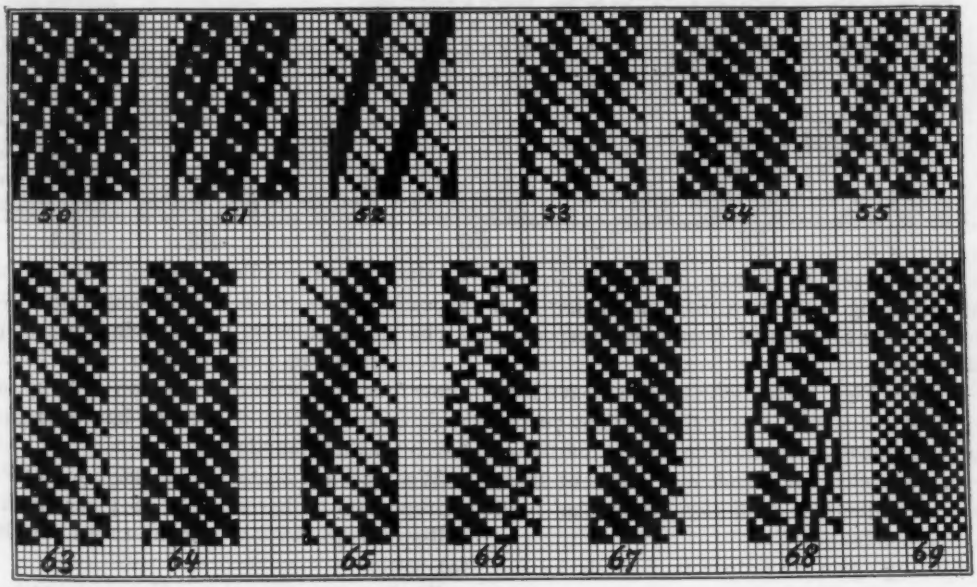


twill by means of careful examining any one of the warp threads of the new weave, the interlacing of which, filling ways, will readily indicate to him the regular twill from which said steep twill has been designed.



gonals of 70 degrees grading, repeating on 7 warp threads and 21 picks, and which consequently have been designed from their corresponding harness regular twills.

Weave Fig. 35 has for its foundation the



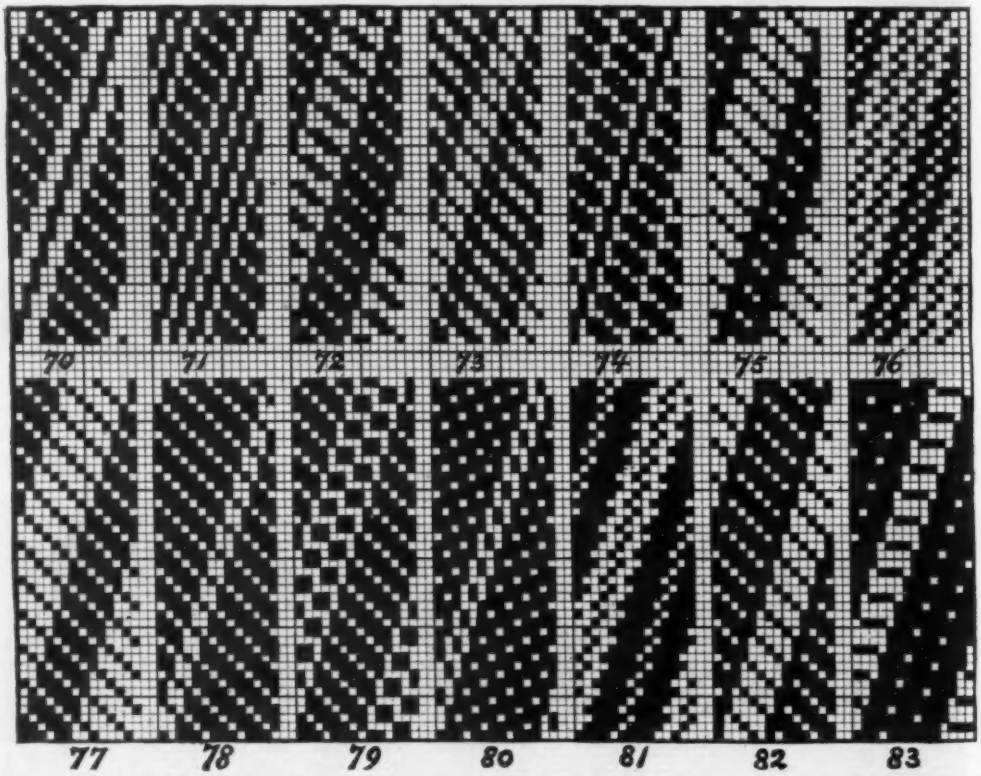
Weaves Figs 35 to and inclusive weave Fig. 43 in this manner call for steep twills or dia- $\frac{3}{6}\frac{3}{1}\frac{3}{1}\frac{3}{1}$ 21 harness regular twill, and from which explanation the student will readily be

able to obtain the foundation for the remaining eight steep twills, Figs. 36 to Fig. 43 inclusive.

Weaves 44 to and inclusive weave Fig. 55 show a collection of 8 harness 70 degrees diagonals, each weave repeating on 8 × 24, and consequently calling for a 24 harness regular twills for their foundation. We again will only quote the foundation for the first diagonal of this collection, viz: Weave Fig. 44, and which we find the same to call for the $^{2}_{3}{}^{1}_{3}{}^{1}_{3}{}^{1}_{3}{}^{1}_{3}{}^{1}_{3}{}^{1}_{3}{}^{1}_{3}$ 36 harness regular twill, the others in turn calling for similar 36 harness regular twills.

The collection of weaves given by means of Figs. 70 to and inclusive weave 76 repeat on 13 harnesses and 39 picks, and consequently have for their foundations 39 harness regular twills respectively.

Weaves Figs. 77 to and inclusive weave Fig.



is the $^{1}_{3}{}^{3}_{1}{}^{3}_{1}{}^{3}_{3}$ 24 harness regular twill, and the remaining eleven new diagonals being in a similiar way constructed from their respective twills.

Weaves Figs. 56 to and inclusive weave Fig. 69 show us fourteen new and excellent 70 degrees diogonals, repeating on twelve harnesses with 36 picks, each and every one of these weaves calling for a 36 harness regular twill for its foundation.

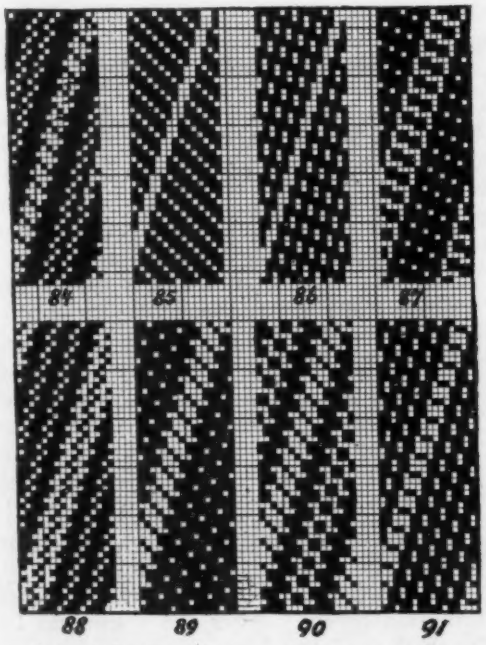
Quoting again the proper foundation for the first one of this series of 70 degrees diagonals, 83 show seven excellent 70 degrees diagonals, repeating on 14 × 42, and having respectively 42 harness regular twills for their foundation.

Weaves 84 to and inclusive weave Fig. 87 show four diagonals, repeating on 15 × 45, and which consequently call for 45 harness regular twills for their foundation.

Weaves Figs. 88 to and inclusive weave Fig. 91 repeat on 16 harnesses × 48 picks, in turn calling for 48 harness regular twills for their foundation.

We have in connection with weaves 70 to 91

omitted to quote any of their foundations, for the same fact as previously given; not quoting these foundations as absolutely necessary, since the student can readily see the foundation twill by examining any one of the warp thread. of the varions weaves, and then follow instructions given at the beginning of the article. This



omitting the foundation shall in this instance serve as the lesson for the student, i.e.

LESSON.

Construct the various foundation twills as have been required in producing the various 70 degrees diagonals given, and where the foundation has not been quoted.

THE MANUFACTURE OF SILK FROM FIBRE TO FABRIC.

Silk is the simplest, and in its properties the highest and most perfect of all spinning materials. It differs from other textile fibres, both as to its nature as well as the machinery used in preparing it for the loom, the machinery used being much simpler and less cumbersome than the processes employed in preparing other fibres.

The countries that produce silk are in the temperate zone. Starting from Japan to China and the belt of Central Asia, including a part of India, the silk-producing belt runs westward through Persia, the Caucasus, Syria, Asia Minor, Turkey, and the countries of South and Western Europe. Silk is divided into three main groups: 1—Cultivated silk, 2—Wild silk, 3—Artificial silk; the most important by far to the textile industry being

CULTIVATED SILK.

The same is imported in the form of "raw silk," i. e., in skeins, which are carefully packed in linen, with an outer covering of rush matting. The bales are square shaped and as a rule contain 9 or 10 compound bundles of 9 or 10 skeins each. These bales, thus received by the manufacturer, on account of the high price of silk, are carefully weighed and their contents subjected to a critical examination. It takes from 2,250 to 3,000 cocoons to make one pound of reeled silk.

New York City, the only raw silk market in America, now holds the first place among all the raw silk markets of the world, Shanghai alone excepted; more raw silk is now annually sold here than is consumed in France, which is still the largest raw silk consuming country in Europe.

The standard sizes of swifts in American mills are twenty-two and twenty-four inches, that is, the skein to measure fifty-six to fifty-eight inches in circumference. The reelers of Japan silks conform more nearly to this standard than do the reelers of Canton and Italian silks. The reelers of China steam filatures are quite uniform in the diameter of their skeins, but are apt to put too little silk in their skeins, which makes them, in thrower's parlance, too "skinny"; by this is meant too little yardage; or weight of skein. There is absolutely no uniformity in the length and size of Canton skeins. Many Italian reelers are approaching uniformity in size or diameter of skein.

The annual supply of raw silk throughout the world is approximately thus:

China	40 per cent.
Japan	20 per cent.
Italy	20 per cent.

Levant ..... 10 per cent.
France, Austria, Spain
and Portugal .... 10 per cent.

Of the total silk supply of the world, this country consumes about one-third, and of which about 46 per cent. is furnished by Japan, 30 per cent. by China and 24 per cent. by Europe.

The sizes of silk most in demand in this market are 13-15 deniers. Low grades and fine sizes, as 10-12 or even 11-13 deniers, are not much used by our broad silk and silk ribbon manufacturers, although the tendency is undoubtedly toward the use of finer sizes.

Its preparatory processes (except for waste silks) are the most simple required by any of the textile substances, in consequence of the great length as of its filaments.

The wonderful insect that makes the silk is the larva of a small moth called Sericaria mori. This moth is classed with the Lepidoptera, or scaly winged insects, family Bombycidae, or spinners. The fibre of the Bombyx mori is the most valuable silk of commerce, and is round and homogeneous, and resembles a glass rod, that being the characteristic and structureless form of the silk all of the Bombycidae.

The species of caterpillar, which is the outgrowth of this moth, is commonly called the mulberry silkworm, since it feeds upon the leaves of the mulberry tree. When pressed for food, the insect will feed upon the leaves of the garden lettuce (Lactuca sativa), but the silk produced is of an inferior quality.

Having been first reared in China, the silkworm is now also extensively cultivated in the countries previously mentioned. It was not until the sixth century (A. D. 551) that silk worm eggs were introduced into Constantinople, and hence into Europe. Legend states that they were brought there in hollowed bamboo sticks by the monks. In all the countries mentioned, besides being cultivated, it is also spun into yarns, and woven into some of the most elaborately figured and lustrous of fabrics. Owing to the greater value of labor in the United States, the industry here cannot compete with those countries mentioned, and therefore most of the raw silk is imported.

The different kinds of silk are distinguishable by their diametrical dimensions, and by the more or less decided appearance of longitudinal stripes, or by polarization colors. In examining raw silk it is advisable to first boil the sample in a solution of soap.

The silk worm exists in four stages, i. e., egg, larva or caterpillar, chrysalis and adult.

EGG.

The eggs, generally called seeds by silk raisers, are about the size and shape of turnip seeds. One ounce will balance about 38,000 to 40,000, which have, when first deposited, a yellowish color which is retained if unimpregnated, but if impregnated the same soon gets a gray, slate, lilac, violet, or dark green hue, according to the breed. If diseased, the egg assumes a still darker tint. The eggs of some specimens are fastened by a gummy secretion of the moth to the substance upon which they are deposited, whereas other specimens (amongst which are the Adrianople whites, and the yellows from Nouka) do not have this natural gum. The eggs become lighter in color when approaching the hatching stage, which is due to the fluid becoming concentrated in the centre, forming the worm, leaving an intervening space between it and the shell, the latter being semi-transparent. After the worm has left its shell, the latter becomes quite white.

The average production of each female moth is about 400 eggs. The color of the albuminous fluid of the egg is the same as that of the cocoon formed later, hence when the fluid is yellow the cocoon will be yellow, and again if white the cocoon will be white.

LARVA.

The eggs are hatched artificially by means of incubators, because if allowed to proceed naturally the caterpillar would be produced at unequal and at long intervals. The temperature of the incubator is allowed to rise gradually to from 70 to 75 deg. F., thus imitating the process of nature. Incubation lasts from 20 to 30 days.

When the eggs are hatched, the caterpillars are covered with small branches of the mulberry tree, and in a very short time, stimulated by hunger, they climb on the leaves, and

are then removed to the rearing house, a closed room where the worms are sheltered from the wind and cold.

The caterpillars at first are very small, barely more than a quarter of an inch in length. The caterpillar or silk worm remains in its larva state about six weeks, feeding on the fleshy parts of the mulberry leaves and changing its skin four times during that period, owing to its growth, and abstaining from food for some time before each change.

CHRYSALIS.

When full grown the worm ceases to feed, shrinks somewhat in size, and climbs up from the feeding tray into the thickly twigged brushes of oak or broom which have been prepared for it on the shelves, and commences to form around itself a loose envelopment of silken fibres, gradually unwrapping itself in a much closer covering, forming an oval ball (cocoon), about the size of a pigeon's egg.

All species of silkworms have two stores of silk, one on each side of the alimentary canal; and below their mouths they have two so-called spinnarets or orifices, through which the silk issues simultaneously in pairs of two fine parallel filaments, forming, in fact, a double thread, which, on exposure to the air, immediately solidifies and becomes silk; hence it follows that silk exhibits no definite structure, but consists of two cylindrical, sometimes flattened, or, more rarely, helical (twisted round the axis) compact threads. The worm generally requires from four to five days in constructing the cocoon and then passes three days more in the chrysalis state.

The cocoons are collected the seventh day after the worms have climbed the twigs. In order to ascertain that they have finished their work and have undergone the transformation into chrysalids, a few cocoons are taken up in the hand and shaken. If a shock is felt, the chrysalids are formed, and the branches are removed. The following day the loose silk is taken from the cocoons, which are then ready for market. From 625 to 1,100 cocoons are required to make 1 lb. of silk.

COCOON.

The cocoon consists of two parts: First, of an outer lining, which is composed of a kind of fluffy silk, sometimes termed floss; this is used for waste, or spun floss, chappe or filoselle silk, and forms an important and separate branch of the silk industry under the name of waste silks, said floss silk having been spun by the worm in first fastening its cocoon to the twigs; and second the inner cocoon, which is a strong and compact mass, composed of a firm and continuous thread, which is not wound in concentric circles as might be expected, but on account of the silkworm moving its head from one side is deposited so as to form short, figure 8 resembling loops, first in one place and then in another, hence in reeling, several yards of silk may be taken off without the cocoon turning around.

The male silk cocoon yields more silk than that of the female; hence, for raising purposes such varieties which give more masculine eggs are by far preferable. Until late years it was not easy to distinguish the male from the female cocoons, the distinction being solely founded on the greater weight, peculiar to the female cocoon; however, the use of X-rays has greatly facilitated the distinction. On account of containing the unripe eggs, rich in mineral salts, the hind part of the female cocoon is found to be by far less transparent than that of the male one.

COLOR.

Chinese cocoons are usually white or yellow, varying from pure white to a pure lemon color, while those of Japan are of a pale green color, and those of France, Italy, and Spain are of a white or yellow color, or occasionally tinged with a pale green, whereas those of Broussa and Adrianople, being the best silk districts of Turkey, are of a pure white color.

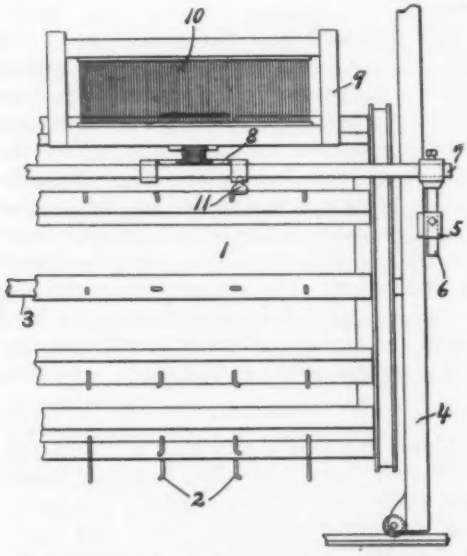
(To be continued.)

AN IMPROVED REED FOR WOOL AND WORSTED DRESSERS.

The object of the improvement is to provide a reed, to be used in connection with a dresser reel, which will guide the yarn to said reel and positively maintain the proper relation between the ends of yarn and the rows of reel pins as defining a section of the warp,

so that when the warp is beamed the sectional divisions occurring in the reeling will not be noticeable, hence possible section lines, i. e. imperfections in the resulting cloth from such a source made impossible.

To do this, the reed is mounted on the reel carriage, which prevents any change in the relation of the reed to the reel section by the mere shifting of the carriage. At the same time, means are provided for the adjustment of the reed to the different sections of the reel, and also for the adjustment of the reed to vary the width occupied by the ends in a section, when such variation is necessary to have the space occupied by said threads conform to the space between the rows of reel pins.



The application of the reed to the reel is best shown by means of the accompanying illustration, which is a front view of a reel and carriage. Referring to the illustration, 1 indicates the reel carrying the rows of reel pins, 2, which are used for guiding the different sections of the warp when winding them on the reel. The reel shaft, 3, is set in bearings in the uprights, 4, said uprights also carrying outwardly projecting arms, 5, which are composed of two pieces made adjustable horizontally. The outer ends carry upright rods, 6, which are adjustable, as shown, and in the top of each is fitted one end of a bar, 7, which carries a slide piece, 8, in the centre of which is movable mounted the frame, 9, carrying the reed, 10. The slide piece, 8, is secured to the horizontal bar, 7, by means of a thumb screw, 11.

It will be seen that the arrangement provides for the establishment of a fixed relation between the reel carriage and the reed, so that an unintentional shifting of the carriage will not disturb the proper relative positions of reel and reed. When the carriage is shifted for the commencement of a new section of yarn, the reed will be properly positioned with relation to the reel section by adjusting it on the horizontal bar, 7, and securing it by the set screw, 11.

In case it is necessary to contract the space occupied by the yarn in one section, in order to properly lay it between the rows of reel pins, 2, for that section, the same can be readily done by turning the reed on its mounting and securing it in the desired position. This avoids the necessity of changing reeds, as would otherwise be the case when the character of the work might require a different number of dents per inch.

SCIENCE IN COTTON AND WOOLEN MANUFACTURING.

Science in textile manufacturing consists in a thorough knowledge of the best methods of manipulation, this applying not only to the mechanical structure of the machinery, but also to the judgment and skill of the men who have charge of it as well. The best machine that it is possible to build may be a failure from the fact that it is never rightly adjusted. It may be perfect in design and mechanism, but the treatment it receives, after it is placed in a mill, may be such that the machine does not properly perform its functions. It is fatal to any finely constructed machine to place it in a mill under the supervision of an incompetent workman. The scientific structure of the machine may be perfect, but the scientific knowledge of the overseers is what is in this instance lacking. However, it may be sometimes the case, that where the machine is somewhat defective in construction the overseer is a man of scientific knowledge, and such a man can tell at

a glance wherein the machine fails to fulfill requirements and in turn assist the machine to nearly fulfill the purpose it was designed for.

Many men are now holding responsible positions in mills who have not made a scientific study of the machinery they work with, or the quality of the results that should be produced by means of a certain machine. This, however, should not be the case, for it is evident that the machinery will then after being started, not receive the attention and care that the builders intended it to receive, and when in turn the manufacturer does not obtain the quality or quantity of work that he is entitled to receive.

In many instances—in fact, with most of the leading builders of textile machinery—special attention is given to the setting up of the machines, one of their practical men, as a rule, remaining for several hours, days or weeks, according to the nature of the machine in question, in the mill, to see that they receive good care. This at the same time prevents improved machinery or devices from being condemned and displaced by an incompetent overseer or second hand who did not know how to manage them, prejudice against a certain machine being in many instances at the bottom of it, and frequently it requires persistent effort on the part of the machinery builders to get everything working smoothly in a mill where his machinery has been only recently installed.

No overseer should be considered competent to run any department in a mill unless he has made a scientific study of the work. He may be able to do the work, after a fashion, without having made a practical study of its several branches; but to be successful in the highest sense of the word in his chosen profession as an overseer of a certain department of a textile mill, he must be thoroughly familiar with every detail of the work.

Probably no other department in a cotton or woolen mill requires a more scientific study than that of picking and carding, from the fact that very much of the success of the mill depends on the scientific treatment of the raw material during the first processes of their manufacture into yarn.

For example, in connection with cotton spinning, take the revolving flat card, as built on scientific principles, and when the carder, who has to operate it, in order to be successful, must thoroughly understand the science of cotton carding. This machine, as now built, is a combination of mechanical improvements and in order to secure a high grade of carding, the overseer must also understand the science of opening, mixing, and picking cotton, so that when the lap is formed and placed at the feed of the card, it will produce an even sliver, and, consequently, an even strand of roving. This calls for the most painstaking effort on the part of the overseer and his assistants. The different grades of cotton, temperatures of the rooms, and the mechanical construction of the machines will all need careful attention. To know how to make an even lap is very essential, and one important factor is an independent dust trunk connection running from each picker into the dustroom. By such an arrangement each picker will form an even sheet of well picked and thoroughly cleaned cotton. A very large percentage of foreign substances will have been removed in this way; for if the outlets from the pickers, where the dust can escape, are not independent of each other, it is a practical impossibility to clean the cotton and form an even lap for the cards, because the currents of air formed by the revolutions of the fans lose their force, and the cotton is thrown on to the cages in uneven lumps, and a lap is formed that will never result in even strand of sliver, besides a large percentage of dirt will remain in the stock.

The same scientific study of the machinery under his charge, in order to get the best results from them, as thus referred to cotton carding, at the same time refers to any overseer of any other department of a cotton, woolen or worsted plant. For example, take the simple process of drying wool—anybody will think he can do it, yet at the same time this process needs study to produce economically, quantity and quality. Not only must the dryer be built on sound principles, but at the same time the person in charge of it should know what wool fibre is, know that by a mistake on his part (overdrying) he can take the life out of the fibre, in turn creating

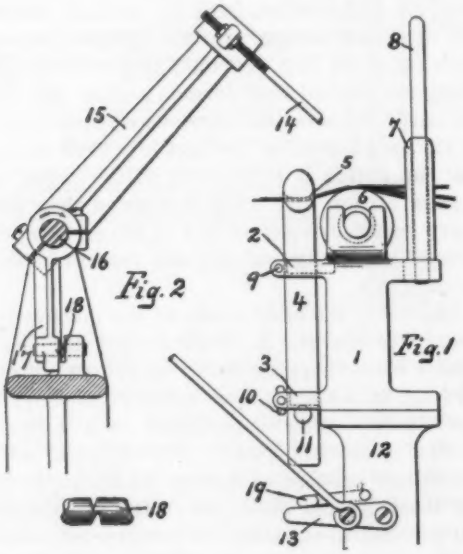
bad work for every department of the mill, resulting finally in imperfect fabrics as a result of his carelessness or ignorance.

However, possibly no other overseer in a woolen mill has to be up to the mark more than the finisher, who handles, in connection with one of the machines under his charge—the shear, a most particular machine to handle, as can be found in a mill; again a mistake in judgment on his part cannot easily be corrected.

STOP MOTION FOR "UNIVERSAL WINDERS."

The object of the motion, as its name indicates, is to stop the machine when an end breaks during the winding operation, said motion being especially adapted to be used on machines where heavy material is to be wound. Its action is positive and does not depend on any continuous motion of parts to be tripped and stopped when a thread breaks.

The details of the construction and operation of the stop motion are shown by means of the accompanying illustrations, of which Fig. 1 is a side view of a portion of the motion for controlling the passage of the threads, and Fig. 2 is a side view of a portion for stopping the machine when a thread breaks.



Referring to the illustrations, 1 indicates the frame for the stop motion, having a top and bottom ledge, 2 and 3 respectively, each being provided with eight slots in which a corresponding number of drop bars, 4, are placed, the latter being formed at their upper ends with hooks, 5, each being supported by having a thread pass under its hook and in turn over a roll, 6. The threads then pass separately between guides, 7, said guides consisting of rolls mounted on spindles, 8. The drop bars, 4, are kept in their respective slots by means of rods, 9 and 10, for the top and lower ledges respectively. The sides of the slots also act to support the drop bars when threads break, by having the hooks on said bars rest on them. The lower ends of the bars, 4, are provided with stops, 11, to prevent the bars from raising too high.

Pivotly secured to a post, 12, of the machine and below the drop bar, 4, is a tripping lever, 13, which has one end of a rod, 14, secured to it, the other end of said rod being adjustably fastened to the outer end of an arm, 15, which in turn is secured to a movable shaft, 16, which also carries a downwardly projecting arm, 17, the lower end of the latter being held by the notches in the catch, 18, (see enlarged view of it compared to Fig. 2). When the arm, 17, is not engaged with the catch, 18, the shaft, 16, is moved longitudinally by a spring connected to it, which shaft causes the belt to be shifted to the loose pulley. Pivoted also in the post, 12, is a lever, 19, which extends horizontally below the series of drop bars, 4, the end resting over the tripping lever, 13.

WHEN A THREAD BREAKS

which had held its drop bar, 4, up, the release of tension allows the bar to drop, so that the lower end of said bar comes forcibly in contact with the lever, 19, which in turn presses against the tripping lever, 13. This action pulls the rod, 14, downwardly and through the levers shown, the lower end of lever, 17, is disengaged from the catch, 18, which thus releases the shaft, 16, and allows the spring to move it horizontally and shift the belt to the loose pulley, thus stopping the machine.

A STUDY OF FLY FRAMES.

The cotton under operation leaves the third process of drawing in the form of a comparatively even sliver. The fibres thus far have been cleaned and straightened, laid in approximately parallel order to form a sliver and at the drawing process made as uniformly distributed in the sliver as possible.

Thus two of the three specific objects to be obtained before the spinning process are accomplished, the objects being to thoroughly clean the cotton, to produce evenness of work and to attenuate the lap to the fine roving. The third object is partly obtained, as the lap has been attentuated to the sliver, but this form is too bulky for spinning and consequently has to be further attenuated. It will be seen at the outset that this process is clearly one of attenuation, although doubling will be made use of in the several machines in order to make the resulting roving as uniform and even as possible.

This attenuation is obtained by means of roller drafting, the extent to which it is carried on being easily shown by considering the weight per yard of the drawing sliver as fed to the first frame of this process, and the weight per yard of the roving from the last frame in the process, which calculation will be made later.

There are generally three machines used in this process, one for making slubbing, one for intermediate roving and one for fine roving. For fine work four machines are used. The operations required in the production of the rovings in all of these processes are exactly the same, i. e., drawing, twisting and winding on bobbins. Each successive machine delivers the stock in a more attenuated condition than it received it, thus the weight per yard is less, or what is the same thing, the number of the roving is higher.

These machines when spoken of as a class are known as "fly frames," from the fact that in each machine one of the principal parts used in their construction is a flyer. There are several different names for the different machines composing this class, the most common practice being to call the first or coarsest frame a slubber, and the second and third roving frames. The roving frames alone are sometimes called "speeders," from the fact that these frames are run at a high rate of speed. Roving frames are sub-divided into "intermediates" and "fine frames," being so distinguished on account of the character of the work produced on each. The intermediate is the first roving frame after the slubber and consequently the work produced is coarser than on the succeeding machine.

In mills where Sea Island or Egyptian cotton is used in the production of very fine yarns, i. e., above 60s, a still finer roving is made before spinning, it being known as "jack roving." The machine used for the production of this roving is called the jack frame, or jack roving frame, it being identical in operation with the other roving frames, the difference in them being that the jack frame is built in smaller proportions and consequently makes a finer roving. The frames in the process would then be slubbing, intermediate, fine and jack frames.

Another method of designating the different frames when four are used is to call the first machine after the drawing frame the slubber, the next one the first intermediate, the next the second intermediate, and the last machine the roving frame.

As was mentioned, all of the machines used in the process are practically of the same construction, the chief differences being in the sizes and the systems of gearing, and in the following descriptions one machine will be analyzed and the points of difference in the others pointed out.

The differences existing in different makes of machines are in detail only, so that the general descriptions given will apply to all makes. The only reason for using three or four different frames, as the case may be, is to reduce the sliver as coming from the drawing frame to the desired counts more gradually than would be the case if only one or two frames were used. So that we shall have a finer hank roving in the intermediate than the slubbing, and a still finer in the fine frame than in the intermediate frame.

The slubber differs principally from the other machines in the manner of feeding the material through said machines, this being due to the difference in the method of delivering the material from the drawing frame and

from the slubber. The slivers from the drawing frame as delivered into cans are fed up to the slubber from the rear, the cans containing the slivers being placed on the floor behind the machine. The full bobbins as made on the slubber are placed in the creel on the intermediate frame and the roving thus fed to the machine. The details of the creel will be explained later.

In the same manner, the full bobbins as made on the intermediate are placed in the creel of the fine frame and the roving fed to that machine, the same being true also for the jack frame when it is used.

Fly frames are constructed with the object in view of attenuating the sliver, but with this attenuation new conditions are brought into the sliver, which render other operations on the frame necessary, because as the sliver is reduced in size, it naturally becomes weaker and consequently has to be twisted sufficiently in order to enable the fibres composing it to hold together with sufficient friction to be delivered from the frame, and to be strong enough for further handling without injury.

By thus having to put twist into what is now called roving instead of sliver, a special method of delivering said roving must be used in connection with the twisting operation. This method is to wind the roving on to a bobbin in a systematic manner during the time that twist is being put in, thus making a continuous operation for the frame.

In summarizing the three necessary operations of the machines, we have:

1st. Attenuation or drafting of the sliver or roving.

2nd. Twisting of the roving.

3rd. Winding of the roving on to bobbins.

The method of obtaining the first operation is very simple, consisting in roller drafting, the same as in the drawing frame.

In following the passage of the cotton through the several fly frames, the reduction of the sliver takes place gradually, that is, the draft is made larger in each succeeding frame. The exact amount of the total draft, of course, depends upon the character of the cotton used, and also upon the numbers to be spun, the disposal of the total draft among the different frames being generally within certain limits which have been found to be best adapted to the frames. The draft on the slubber when using American cotton is from 4 to 5, for the intermediate from 5 to 6, and for the fine frame from 5 1/2 to 6 1/2.

When long staple cotton, such as Sea Island and Egyptian, is used for the production of high counts of yarn, the draft on the slubber is from 5 to 5 1/2, for the intermediate from 5 1/2 to 6 1/2, for the fine frame 6 1/2 to 8, and for the jack frame which would be used in this instance, from 5 1/2 upwards.

Variations in the amount of draft on different machines are frequently introduced in order to obtain the same total draft, the reason for this being easily seen when considering the process as a whole. The three frames through which the cotton must pass, easily allow a variety of divisions in the arrangements of the drafts, which is taken advantage of in making changes only in one or two frames instead of changing all, when another number of roving is to be made. This variation should not be carried too far as it is the safest plan to let each frame do its own share in the work of making the roving finer.

The method of putting twist into the roving calls for a rapidly revolving spindle which carries a flyer placed on the top end, said flyer being so constructed that it can be threaded with the roving through its axis of rotation at the top, said roving then being guided through a hole, situated out of the centre of rotation, so that as the flyer is revolved, the roving is carried around the centre of rotation and consequently receives a twist for each revolution of the spindle.

Arrangements are made in the frames whereby the amount of twist as going into the roving can be easily and accurately regulated. The amount of twist per inch in the roving is to a certain extent a matter of experience, depending upon several conditions, as for example, the length of staple, the uniformity and cohesiveness of the fibres, etc., although a certain basis has been found from which to work. The amount should never exceed that which is necessary to give it just sufficient strength for handling, for it must be clearly understood that the merest excess of twist in the roving would interfere to a proportionate extent with any further drawing in

the following machines. Thus, we can see that, although the twisting is a necessity for giving cohesion to the fibres during the winding operation, yet the succeeding processes must be kept in view, and the twists arranged so that the effectiveness of any future drawing action will not be interfered with by said twist.

The operation of winding is the most complicated of the three operations in connection with the fly frames and the mechanism used for winding a bobbin will require a careful consideration.

The roving is wound on the bobbin by placing said bobbin over the spindle and allowing the delivery portion of the flyer to deposit the roving on to the bobbin, the difference in speed between the flyer and bobbin being just sufficient to allow the bobbin to take up the delivered roving. The roving is coiled around the bobbin so that the coils lie side by side in one layer, this being obtained by the upward and downward traverse of the bobbin, the traverse becoming shorter after each layer of roving is deposited in order to make the bobbin cone shaped at each end.

A fly frame is easily distinguished in a mill by having a large number of spindles running in a single frame, each spindle being a duplicate of the other and producing similar bobbins.

At the slubber, the slivers are passed up from the sliver cans through guides at the back of the slubber and over a slowly revolving octagonal shaped roll, the object being to aid the slivers in passing to the drafting rolls from the cans. The slivers are then passed forward through the frame, the resulting rovings being wound on bobbins, which when full are taken off of the frame and then put up in the creel of the intermediate frame to be in turn fed to that machine. Rovings are delivered and wound on bobbins in a similar manner to those on the slubber, and when full are placed in the creel of the fine frame to be fed to that machine. As the rovings are made smaller at each succeeding process, smaller bobbins are used to wind the delivered roving on. The empty bobbins used on these frames are usually made of wood, although substitutes made of paper, etc., have been tried. The best bobbins are made by having the lower ends of the bobbins protected by a wire placed in a groove, this tending to keep them from splitting. The bobbins are notched on the bottom so as to get a grip on the revolving holder.

All bobbins on any machine should be constructed to exact dimensions, so as to fit the spindles as closely as possible without binding, and also to have the outside diameters uniform, otherwise the roving cannot be wound on such bobbins at the same time with the other bobbins.

Bobbin gauges are now used to accurately test both the inside and outside diameters of a bobbin before it is run on the frame.

The creel on a fly frame consists of a framework that extends the whole length of the machine, and is used to hold the skewers on which the full bobbins are placed. Skewers are rounded pieces of wood, which are run into the holes in the bobbins, to hold them in the creel, having both ends pointed for bearings so as to reduce the friction and thus require less pull to rotate the bobbin. Near the lower end of the skewer, a knob is fitted on for the bobbin to rest on. The ends extend a little farther than the bobbin, so as to be placed in position in the creel with these ends as bearings.

(To be continued)

A NEW STOP MOTION FOR SPOOLERS.

The object of this motion is to stop the rotation of the respective spool when a thread breaks. The motion is so arranged that upon the breakage of a thread, the fallen drop wire will be automatically returned to its raised position, in which position the eye of the drop wire can be readily threaded for the continued operation of that spool.

This stop motion consists principally in an arrangement for raising the spool slightly when a thread breaks, in order that it may be stopped without having to stop the rotation of the spindle carrying it; and also in the arrangement for raising the drop wire to its normal position to be threaded again. The details of the motion, as well as its method of operation, are best shown by means of the accompanying illustrations, of which Fig. 1 is a side view of the stop motion, showing

the parts in the position after a thread is broken, and Fig. 2 is a side view, partly in cross section, of a portion of the arrangement for raising the drop wire into position after a thread breaks.

Referring to the illustrations, 1 indicates the spool upon which the thread is being wound. Situated in front of the spool is a loose sleeve, 2, pivoted at 3, and having at

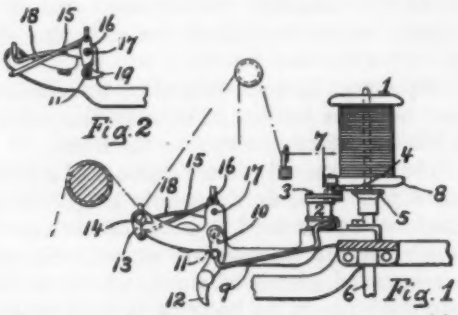


Fig. 2

Fig. 1

its lower end a spring arrangement which tends to move said loose sleeve, 2, to the position shown in Fig. 1; in its normal position being entirely out of contact with the spool.

Situated on top of the loose sleeve, 2, is a loose pin, 4, which, when a thread breaks, comes under the spool, 1, and raises it off the supporting disk, 5, of which the spindle, 6, and by means of a loose rubber wheel, 7, coming in contact with the lower rounded head, 8, of the spool, thus stops its rotation.

Connected to the lower portion of the loose sleeve, 2, is a rod, 9, the other end of which is loosely connected to a gravitating catch lever, 10, said lever being attached to a shaft, 11. In its normal position this lever, 10, is held practically horizontal by having its end, 12, held by a catch, 13, as pivoted at 14. It is through this catch, 13, that the loose sleeve, 2, is permitted to be acted upon by the spring arrangement, previously mentioned, and thus have the pin, 4, to raise the spool.

Connected to the catch, 13, is a rod, 15, its other end being secured in a lever, 16, as pivoted at 17, the drop wire, 18, being also pivoted at lu, and movable with the lever, 16. The drop wire, 18, is held in the position shown in Fig. 2 by a thread passing through its eye, and when said thread breaks, the end of the drop wire will fall and by its connection with the lever, 16, will cause the same to move slightly to the left and through the rod, 15, push the catch, 13, out of contact with the catch lever, 10, thus allowing the latter to act as previously explained.

On the same shaft, 11, which the catch lever, 10, is attached to, is a wiper arm, 19, as seen in Fig. 2, and consequently when the catch lever, 10, is released and swings down, it partially rotates the shaft, 11, and thus causes the wiper arm, 19, to press against the lower end of lever, 16, and bring it back to its former position, and at the same time, the drop wire, 18, through its connection with said lever, will be brought back to its normal position ready to be threaded again. When the thread which was broken has been properly pieced up, the catch lever, 10, is snapped back into the catch, 13, which action causes the spool to drop into its regular working position and begin to wind the yarn again.

AN INGENIOUS METHOD OF CLOTHING THE ROLLS OF NAPPING MACHINES.

The object of the new method is to clothe the napping rollers with card clothing, so that said clothing is wound spirally and oppositely on each side of the central transverse plane of the roller, and this in such a manner that any uncovered space extending circumferentially may be avoided, thus preventing wrinkles in the cloth when treated by napping rolls thus clothed.

The reason for having one-half of the card clothing wound spirally in one direction and moving toward the nearest end, with the other half the roll wound oppositely, is to keep the fabric, which is passed over it, extended in its full width.

The improvement more particularly consists in a specially shaped tongue of card clothing which is used at the central portion of the circumference of the roll, as a start for each oppositely disposed strip of card clothing.

The shape of the tongue is shown in the accompanying illustration, which is a diagram showing the tongue lying straight.

It will be noticed that the tongue is V-shaped, the small end having a hole, 1, for the insertion of a screw, while the other end

is made with ears or ends, 2 and 3, with a converging space, 4, between said ears, corresponding in size and outline to the opposite or small end of the tongue, since when placed on the roll, the small end will fit into said space, 4. Each ear, 2 and 3, is provided with holes, 5 and 6, respectively, for having buckles attached to them, the other portion

of said buckles being attached to the respective ends of the strips of card clothing which are to be placed on the roller.

When covering a roll, the tongue is first secured to it by its small end with a screw in the hole, 1, then the tongue is wrapped around the roll, the buckles having previously been attached, so that the ends of the card clothing may be secured to the ears, 2 and 3. The clothing is then put on the roll in the usual manner.

Although there are no wire teeth at the places occupied by the buckles and hole, yet this space is so small as not to affect the proper working capacity of the reels.

In the Middle Ages the woolen industry in Spain was in a thriving condition. The Spaniards protected it with such jealous care that the exportation of a live merino sheep was punishable with death.

POINTS ON CHEVIOTS.

Cheviots are a class of fabrics used extensively, for the fact that they form a class of cloth most suitable for wear, besides being more durable than a great many other fabrics. They are made both in light weights as well as heavy weights, being a useful and valuable fabric in either instance. It is in their process of manufacture, as well as in the general construction of the fabric itself, that the basis for a serviceable cloth is laid.

The reader may ask the question: What is cheviot? This name is of English origin, and in order to fully answer the question we must go back about 70 years in the history of the development of the English woolen industry.

When the change in the production of wool began, which has caused England to draw its wool supply from Australia, the La Plata and the Cape, the English manufacturers considered how they might best utilize their at that time very inferior colonial product. It was totally unfeasible to manufacture from it similar goods as from the leading classes of European, especially of German and Austria-Hungary wools, on account of the difference of quality, which then was still much greater than at present, whereas since then European wools have become coarser and the trans-oceanic finer. A strongly-fulled and proportionately gigged fabric would then have presented the ordinary nature of the colonial wool in such a shocking manner that nobody would have bought such goods. In this dilemma only such use could be made of these trans-oceanic wools as demanded none of the noble properties of European wools. It was at that time already known that strong felting diminishes the soft feel of the woolens, because the tips of the fibres protrude from lie felt-like bristles. Moderate felting, however, leaves the goods soft and pliable, because it causes only slight changes of the position of the wool fibres in the yarn. The object was, therefore, to make a fabric which, when woven with a close texture, was produced pretty nearly as close as the finished stuff was wanted to be, and, therefore, required only a light fulling.

As types of such goods, certain articles existed which were made by Scotch manufacturers from their low-grade country wools (cheviot wools), the Scotch plaids, which at that time were hardly salable outside of England. In the fashion of clothing, this kind of make, thick yarns and close weaving, with little fulling, had not yet been introduced. It was then undertaken to manufacture such fabrics by using the colonial wools, which were even often mixed with dead hair, in connection with the Scotch wools previously referred to, and which possess particularly good properties for this class of fabrics. The favorable experiences thus made in England with the cheviots gave rise to their general introduction into the market. Corresponding with the light fulling, the new goods were only very little or not at all gigged, and in accordance with the burry, knotty, often overgrown condition of the wool, such color mixtures and indistinct designs were chosen that the irregular quality of the raw material itself had to contribute to the peculiar appearance of the fabric. Thus the original "cheviot" came into existence.

What is called so today in many cases does not deserve the name. A fabric, for instance, from thick yarn and ordinary wool can no longer be called cheviot if it has undergone so much fulling that the threads can no longer easily be separated. Again, a piece-dyed, but otherwise after the cheviot-principle produced fabric, especially with cotton warp and woolen filling, can hardly be called a cheviot, because the real cheviot requires color mixture and design. Usage, however, allows in this case the production, from thick, ordinary yarn and little fulling, to pass as criterion for cheviot.

The finishing of cheviots is of the greatest importance with reference to a pleasing result in appearance as well as feel of the fabric, since cheviots owe much of their popularity to these two particulars. For this reason it will be of interest to sketch briefly the course of treatment to which cheviots are subjected in the finishing room.

Burling and mending do not require in connection with these fabrics as much attention as with some of the finer and better classes of fabrics, and this from the nature of the cheviot finish; however, there are some classes of cheviots which call for more attention in these respects. The closeness of the finish and the lightness of the goods must be taken into account in determining just how much work is required in these early steps in finishing the fabric. If the pattern is one which contains colors, and these stand out in relief, then especial care is requisite. The nature of the finish required and the style of design and the way in which the effects are produced, will have their influence upon the processes which are employed at various stages in the finishing, since many things may be permitted in the case of the rough-finish cheviot which would be entirely out of place in connection with a smooth-finished or close-finished fabric. In the first mentioned kind, the threads are partly covered by the fuzz of the nap, while in the last class every thread shows up with more or less distinctness, and imperfections or mistakes are clearly seen, hence the greater care required in connection with the latter class.

The peculiarity of finish also has a very marked effect upon the amount and kind of fulling which the goods are made to take, since a felt that is too marked would, as mentioned before, not be permissible, and yet the fabric needs to have body and firmness enough to make it substantial and durable. A fulling of from an hour to an hour and a half ought to be all that is required, and if the soap is all right this part of the finishing process will be satisfactory. A healthy, heavy boiled soap, of medium body, will not only accelerate the fulling process, but also adds materially to the ease and success with which the succeeding process of washing is attained. The aim here is to keep the goods firm and substantial, yet at the same time soft, agreeable, and natural to the feel, and any detail that leads to this end is valuable. Suppose, then, that the fulling is done, and the soap used was of sufficient body and strength to make the washing possible without any further addition of soap, the goods are then treated as follows: When run into the washer, add about 25 gals. of warm water to the piece, and allow it to run for ten min-

utes, and then the dirt and lather is let off by means of the gates. After this first lot of dirty liquor is removed, a second quantity of water, similar to the first, is admitted, and the goods run in this for about twice as long. By this time the latter ought to be clean and the goods free from all dirt and ready for rinsing. This second bath is drawn away and rinsing proceeded with in the usual manner. This should be thorough and complete, so that no traces of dirt are left in the goods.

At this stage the burr-dyeing takes place, if the step is necessary, and the goods are again washed clean in rinsing water for half an hour longer. Furthermore, at this stage, the use of fuller's earth, as used extensively in England and Europe, will have a very salutary effect. It will serve to cleanse the goods, to increase the desirability of their feel, and also, in a measure, to set the color of the dye. When this treatment is finished, and the earth solution is thoroughly removed from the goods by another and a final rinsing, the cloth is ready for extracting and dyeing. If there happens to be any cotton in the construction of the cheviot, it will not do to allow the fabric to lie about wet before the dyeing takes place. But if the stock is right, it may help the feel and finish to allow the cloth to lie a few hours in the damp after the extracting is done. In such a case they must be carefully rolled, free from all wrinkles and folds.

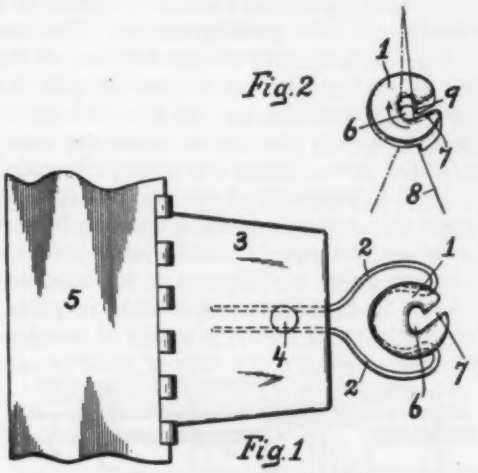
(To be continued.)

A NOVEL THREAD GUIDE.

This thread guide is designed to be used in connection with wet twisters and is made of porcelain, being so constructed as to prevent the escape of the thread from it during the normal operation of the twister, said guide being provided with an open passage for easily threading up the guide when required. Proper means are also provided for holding and adjusting the thread guides over the spindles in the machine.

The construction of the thread guide and its application to the thread board of the twister are best shown by means of the accompanying illustrations, of which Fig. 1 is a plan view of a thread guide and its support, and Fig. 2 is a perspective view of a separate thread guide, showing clearly its construction.

Referring to the illustrations, 1 indicates the porcelain thread guide, which is held by means of a wire fork, 2, the latter being adjustably secured to the thread board, 3, by a



screw, 4, and bolt underneath the thread board. The thread boards, 3, are pivotally attached to the framed board, 5, by the ordinary hinge arrangement. The thread guide, 1, is made with an ordinary eye, 6, near its centre, and leading from said eye, 6, is a passage, 7, which is inclined with respect to a radial line drawn from the centre of the eye. The thread guide is flanged shaped at the top, the body portion being made tapering from the lower side in order to make a groove, so as to be held by the wire fork, 2, and into which it is forced.

The principle on which the thread guide is based to keep the thread, 8, from flying out during twisting is that when the thread is being twisted in the direction of the arrow, it will be carried around the side of the hole, 6, to the point, 9, at the edge of the passage, 7, and from there it will engage the opposite side of the passage, 7, and thus be guided back into the eye, 6, and prevented from escaping. Provided it was desired to twist the thread in the opposite direction, thread guides must be used with the inclination of the passage, 7, in the opposite direction to that shown.

AN IMPROVED QUILLING MACHINE FOR SILK.

The object of this machine is to wind silk yarns into the form of cops for use during weaving. The cops are produced on spindles in the machine which receive constant revolution, said cops being built up by means of a traverse and yarn-guiding motion. The size of the cop itself controls the building of the cop by having a wheel in contact with the upper portion of the cop, the friction between the two causing the cop to rotate the wheel and this latter being on a rod, threaded through a projection of the traverse motion, causes said rod to work itself outwardly and the wheel just out of contact with the cop. The yarn guide is connected to the threaded rod and by moving outwardly with it, guides the yarn onto successive portions of the spindle, thus producing the desired build of cop.

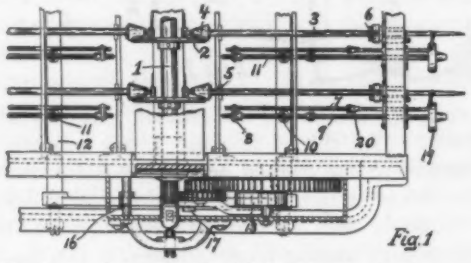


Fig.1

Each cop is controlled individually by its contact wheel, so as to insure of each cop being firm and evenly built up.

The details of the construction and operation of the machine are shown by means of the accompanying illustrations, of which Fig. 1 is an end view of the machine, showing more especially the traverse arrangement, and Fig. 2 is a top plan view of an end portion of the machine, corresponding to the end, shown in Fig. 1.

Referring to the illustrations, 1 indicates the driving shaft of the machine, on which are secured friction disks, 2, and these in turn drive the spindles, 3, separately, through the respective friction cones, 4, on the ends of the said spindles, 3. The spindles are held by special bearings, 5 and 6 respectively, the latter being secured in a pivoted holder which is actuated when a cop is full and swings that end of the spindle so that the other end carrying the friction cone, 4, will be thrown out of contact with the friction disk, 2, the bearing, 5, being used as a pivot for the spindle, and in this manner stopping the rotation of said spindle. The yarn traverse motion consists of yarn guides, 7, the eyes of which are directly over their respective spindles, and

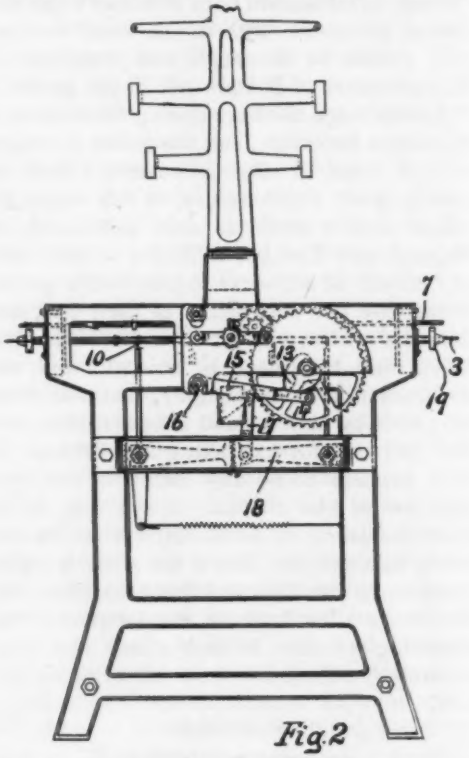


Fig.2

the back ends are connected by forks, 8, to threaded rods, 9. The threads on these rods work in threaded bearings, 10, on top of their respective rods, 11, which are secured to a shaft, 12. It is through the partial backward and forward rotation of this shaft, 12, which gives the traversing motion to the thread guides, so that they may properly build the cop. The partial rotations of the shaft, 12, are obtained from a cam, 13, which is positively driven, through the gears shown, from the main shaft, 1. The cam, 13, presses on a roller, 14, carried by a lever, 15, as pivoted at 16, and this lever in turn presses against a lever, 17, connected to one of the two arms, 18, which are formed with teeth at their point of contact and are connected at their other

ends to the shafts, 12, respectively, thus imparting motion to them. The length of the stroke or traverse may be varied by placing the end of the lever, 17, in different notches on the lever, 18.

The method of building the cop is to gradually change the position of the yarn guide eye as the cop becomes larger, and is done by the use of a contact wheel, 19, on the end of each rod, 9. This wheel is so placed that as yarn is wound on the spindle, the wheel will come in contact with the yarn, and owing to the rotation of the spindle will also be rotated. This rotation will cause the threads on the rod, 9, to work themselves through the threaded bearing, 10, and thus cause the rod to move outwardly. When the rod, 9, is moved, through the connection at 8, the yarn guide rod, 7, is also moved outwardly and thus guides the yarn on to successive portions of the spindle. The motion of the rods outwardly is very gradual and the cops are thus made firm and smooth. A dog, 20, is provided on each traverse guide rod, 7, to regulate the length of the cop built, by coming in contact with the bearing arrangement at 6, when the cop is of the proper length, and releasing a catch which frees the holder of the bearing, causing the latter to swing around so that the friction cone, 4, will go out of contact with friction disk, 2, and thus stop the winding on of the yarn. The spindle is easily set again by simply snapping it back into place when the dog, 20, is out of the way. The yarn guide rod, 7, and rod, 9, are reset by simply lifting the threaded part of the latter rod out of contact with its threaded bearing and pushing them backwardly, then allowing the threaded rod to enter again into the threaded bearing.

EVEN AND UNEVEN ROVING IN WOOLEN SPINNING.

Since carding and spinning go hand in hand in woolen manufacturing, it is first necessary to refer briefly to carding. As a rule the carder calculates his roving to be drawn-down to about one-half, on the mule, in order to assist in drawing out and reducing any lumps or other irregularities in the roving in the final yarn produced. There will be no trouble in drawing out a good even roving made from long, even stapled wools, this one-half or more in spinning; however, the best spinner will find it impossible to draw out uneven roving or such as made from short staple stock more than one-third, without keeping the mule standing most of the time piecing up broken ends.

With reference to uneven roving delivered to the spinning room, the lumpy sorts will be the ones making the most trouble, in fact if not impossible for a fine thread to be spun out of it, since it is a well known law in spinning that the lumps will take the twist only, after the thin places, between said lumps, are twisted extra hard. This naturally tends to increase in proportion the size of the lumps, and in turn reduce the thinner places still more.

1

2

In order to explain this subject, the accompanying two illustrations are given, and of which Fig. 1 represents an uneven, lumpy, unspun roving or carded wool. Examining the illustration, we will find that instead of having an even surface, said roving is lumpy, caused either possibly on account of dull card wires, or insufficient carding, or improperly prepared stock, etc., etc. Such roving may now and then occur in any mill, but it should be seldom the case, and if found, the trouble at once remedied by proper attention to the set of cards where it was made.

In drawing out this roving on the mule, the same receives a few turns per inch as the carriage back off. The drafting occurs at this point, and since the tendency is for the twist to take effect between the lumps, as previously mentioned, it follows that the lumps are more or less untouched with reference to twists by the mule, in turn remaining soft and pliable, being drawn out only slightly in size, whereas the thinner places between the lumps have taken all the twist which actually ought to have gone in the full length of the thread

under operation, said fine hard twisted portions of the yarn not drawing down any to speak of, and for which reason the mule does little towards correcting such imperfect roving, resulting in an uneven yarn as readily seen by means of examining diagram Fig. 2, and where we see that the bunches, as mentioned before, although slightly drawn out as to size, are yet distinct in the thread, the thinner portions of the thread, as having taken all the twist, clearly showing too much of it. The reason for this is found in the fact that the larger in circumference a body, the harder it is to revolve it, and since the lumps in the roving are of a larger diameter as compared to the thinner portions of the thread, it consequently follows that said lumpy portions of the thread acquire little, if any, twist compared to the thinner portions, in fact all the thinner portions in the full stretch of roving under operation must be twisted solidly into a wire, as we might say, before twist is put in the larger places, i. e. the bunches, each bunch acting as a pin of a fixed lever for the length of the thin roving adjoining.

The proper amount of the draft to be put in the yarn at the mule, requires good judgment, the rule usually observed being that the longer and coarser the stock, the quicker the drawing should be. If the roving pulls out from between the draft rollers during drawing, it is a sure sign that the draft is too slow, and for which reason put on a larger draft gear (backing off gear), or let out on the upper steady rope and take up at the bottom. If the roving snaps off about half way between the draft roll and the tops of the spindle during drawing, it is an indication that the carriage is backing off too quickly, the twist not having a chance to take hold, and in which instance reverse the previously given advice.

This law of uneven roving, producing bunchy roving, and in turn uneven bunchy yarn, although detrimental to an uneven thread, is frequently taken advantage of in the manufacture of bunchy yarn for the sake of producing fancy effects in fabrics, in fact it is all the rage at present in connection with fancy dress goods, not only in the woolen and worsted trade, but at the same time in cotton and silk.

With reference to woolen carding a double ring doffer system is devised, and which delivers a regular lumped roving, and which then in turn is twisted just enough to impart sufficient twists to the yarn, i. e. to the spaces between the bunches in order to produce a thread capable of being woven; in this manner resulting in the fancy thread now extensively used.

A FEW QUALITATIVE TESTS FOR TEXTILE FIBRES.

1. Microscopic Appearance.

2. Cotton burns without smell, while wool and silk shrivel up and give off the odor of buring animal matter.

3. A boiling solution of caustic alkali dissolves silk and wool, but has little action on cotton.

4. Concentrated sulphuric acid dissolves cotton and silk in the cold, while wool is little effected.

5. Schweitzer's reagent (ammoniacal solution of oxide of copper) dissolves cotton and silk, but not wool. Cellulose is reprecipitated by gum, sugar, or acids, but the silk substance by acids alone.

6. A solution of basic chloride of zinc dissolves silk, but not cotton or wool.

7. A solution of cotton in concentrated sulphuric acid gives a purple coloration with an alcoholic solution of alpha-naphthol. This reaction really indicates the presence of sugar, and is therefore not given by silk or wool.

8. Million's reagent (mercurous-mercuric nitrate) gives a red color with silk or wool, but not with cotton.

9. Wool (also hair and fur) is blackened by heating with a dilute solution of plumbite of soda, which is prepared by dissolving litharge in caustic soda. Silk and cotton, as they do not contain sulphur, are unaffected in color.

10. Nitric acid, colors wool and silk yellow, but does not affect cotton.

11. An acid solution of indigo extract, dyes wool and silk, but not cotton.

In 1809 there were 17 cotton mills in operation in Providence with 14 thousand spindles and 1,000 looms.

CORRESPONDENCE AND NOTES

Upon Textile Topics at Home and Abroad.

SPINNING FRAME PRODUCTION.

BY A FITTER.

In looking over the June issue of the Textile World Record, I was much interested in an article entitled, "Spinning Frame Production, by J. T. B." The author says the production of a spinning room may vary according to the counts being spun and the ultimate use of the yarn, that is, whether it is to be used for filling, warp, hosiery or any other special purposes, and that in equipping a mill with spinning machinery it is necessary to consider the class of yarn to be spun as the speed for one would not be suited for another.

From the foregoing remarks any one not familiar with spinning or spinning machinery would be led to believe that when equipping a mill with spinning machinery the only question that the mill man has to decide is the proper speed for that class of goods or yarn. There are many other questions to be decided besides the speed of the spindle and front roll when equipping a mill for any class of yarn which, if not so important, will very materially alter the production. For instance, the length of the traverse, the diameter of the ring, the diameter of the bobbin, etc., etc. There are many other points to consider also, but I shall not go into the details of assembling a frame, but will speak only of those points that have direct result on the production.

Suppose it is required to start a mill on 40's warp. The question would be: What is the best length of traverse to give the frame so as to get good work and also get the best production? A long traverse will give more production than a short one because more yarn can be wound on the bobbin, but on the other hand if the traverse is too long it will cause the yarn to break on the frame and on the spooler when unwinding.

The next question would be: What is the proper diameter of the bobbin to use for 40's yarn so as to get the highest production and best quality of yarn? More yarn can be wound on a bobbin of small diameter, and, consequently, the frame can be run longer without stopping to doff, which will increase the production. On the other hand, if the bobbin is too small it will cause a pull on the traveler which will break the yarn and make bad work.

The next thing to decide is the diameter of the ring to use for 40's yarn. A larger bobbin can be built on a large ring and this will increase the production by obviating the necessity of frequent doffings, but if the ring is too large it will have the same effect as a small bobbin — it will cause a pull on the traveler which will break the yarn.

The taper of the yarn on the bobbin will increase or decrease the production according to its length. More yarn can be wound on a short tapered bobbin than on a long one, and therefore the frames can be run longer without stopping to doff.

In speaking of twist, J. T. B. says that the twist for filling yarn is equal to the square root of the counts multiplied by 3¼. It is true that in talking about twist it is customary to speak of twist as "4¾ twist" or "3¼ twist," but in practice those rules are very largely neglected and from 1 to 5 turns more than the square root of the counts multiplied by 3¼ are put in the yarn, depending on the stock that is spun and whether it is carded or combed. I know one mill where 25 turns per inch were put in 36's yarn made from one inch American carded cotton.

In J. T. B's table of front roll speed and production we find that 100's should run with

70 R.P.M. front roll speed. What R.P.M. would have to be put on for warp twist? The square root of 100 is 10. $10 \times 4.75 = 47.5$, therefore 47.5 turns is required for 100's yarn. $4.75 \times 70 \times 3.1416 = 10{,}445.82$ R.P.M. of spindle. This exceeds the high water mark spindle speed by over 400 R.P.M., and that too on 100's yarn. Every one knows that the maximum spindle speed is reached on yarn between 60's and 65's. The front roll speed should not be over 60 R.P.M. for 100's.

Let us look into his method of calculating the production of his spinning frame. Take for example 10's. His method is to divide the revolution of the front roll per minute by the counts multiplied by 3.

Example 10's: R.P.M. of front roll, $160 \div (3 \times 10) = 5.3$.

Example 100's: R.P.M. of front roll, $70 \div (3 \times 100) = .23$.

I will now give my formula, and while it is not so convenient will more than pay for the extra time by a larger production, and that is what we are working for.

Multiply the diameter of the front roll by the circumference, by R.P.M. of front roll, by minutes in 1 hour, by 58 hours less 5%, and divide by counts multiplied by inches in 1 yard, by yards in one hank.

Example: $(1 \times 3.1416 \times 160 \times 58 \times 60 \times .95) \div (\text{counts } 10 \times 36 \times 840) = 5.494$ lbs.

Take 100's: $(1 \times 3.1416 \times 70 \times 60 \times 58 \times .95) \div (100 \times 36 \times 840) = .24$ lbs.

In his examples the same counts and speed will give respectively 5.3 and .23. Suppose there are 10,000 spindles in the room, they would give 53,000 and 2,300 pounds respectively, while my formula will give 54,940 and 2,400 pounds. A gain of 1.940 pounds on one and a gain of 100 pounds on the other. This is a large gain on my side, but if 50,000 spindles were running instead of 10,000, the difference would be five times greater or 9,700 pounds for 10's.

Let us now take a peep at his spindle speed for 25 turns per inch, 120 revolutions of front roll. We are going to put in 25 turns per inch and the front roll is one inch in diameter.

$120 \times 1 \times 3.1416 \times 25 = 9{,}424$.

It takes exactly 9,424 turns of the spindle to put in 25 turns, not 9,900. If we figure the twist through the train of gears and get 9,424 for an answer, then some allowance for slippage should be made, but, as it is, it is the actual speed of the spindle required to put in 25 turns per inch.

A NEW LENO MOTION.

A device for weaving leno effects without the ordinary doup heddles is shown at Figs. 1 to 4, and has recently been patented in this country. Fig. 1 is a cross section; Fig. 2, a longitudinal section of a portion of a loom equipped with the device; Fig. 3 shows a guide hook; Fig. 4 is a pattern woven with the new motion.

Fig. 1 represents the weaving of plain cloth. D, D′, are two frames similar in construction to the heddle-frames, but are for the exclusive purpose of engaging the ends

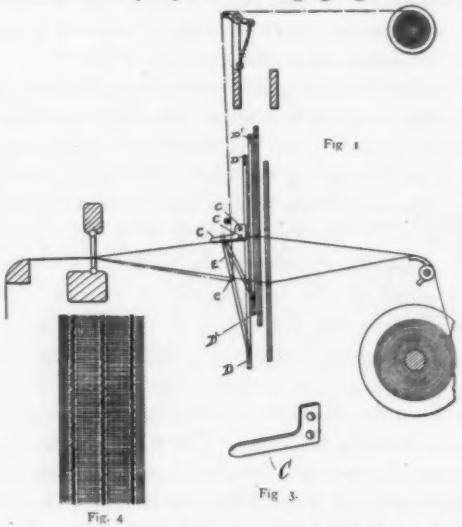


Fig. 4

of the carriers, E, and through which the carriers are all actuated in time with each other.

The principal feature of this invention is the stationary finger or hook and the improved method of carrying the loop-thread, by means of the finger, over a certain number of warp-threads by a flexible looper or carrier, E. This carrier is constructed of a flexible cord, wire, leather, or any suitable material, and has an eye, e, at or near its middle por-

tion. The bight of the carrier is passed over the loop-finger, C, and one end secured to the lower bar of each of the frames, D and D'. This loop-finger or hook, C, is a short piece of flat wire located near the harnesses and preferably fixed just above the shed at its extreme upward stroke. These fingers project forward a short distance and may be rigidly supported in position by the two rods, c, c, to which they are secured, or by any other convenient method. Any number of these fingers may be employed, according to the pattern desired to be woven. The flat loop-forming fingers, C, are supported and fixed at one end and extend forward a short distance. The flexible looper or carrier above described is attached to two frames. In the dobby-head shown two jack-levers are used to operate each of the two heddle-

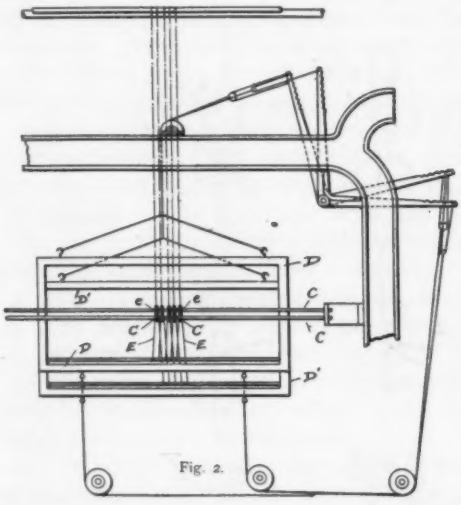


Fig. 2.

frames, each frame being drawn alternately up and down by the movement of the jack-levers because of the connections between the top and bottom of each frame with each arm of the jack-levers. These connections are effected by attaching each end of a flexible cord to the arms, with the bight of the cord engaging a pulley held on the end of strap leading from one of the harness-frames. In operating these jack-levers thus connected by holding one jack up and letting one down the frame is in its centre position, and when both jacks are either up or down the frames are in a corresponding position.

The binding-thread is led from a spool on the rear of the loom over a tension-bar, carried down in front of the harness, threaded through the eye of the carrier, and led through the reed to the ground-warp, into which it is secured by the laying of the weft-threads. By properly pegging the links of the chain in the dobby-head this binding-thread may be held up on top of the wire any number of picks, whereby any desired length of fabric may be woven before the binding-threads will be caused to cross the warp-threads engaged thereby; or the thread may be drawn down on each side of the wire and held as long as desired, in which position the binding-thread lies on the back of the web; or this thread may be carried up and down on the same side of the wire, thus forming a plain weave without binding the warp.

It will be observed that by the use of this device only two harnesses are required to weave any pattern, while by the old method three or more are employed. It is claimed that by running the binder-threads in front of the harnesses the work is much more accessible and easier to operate; also that this arrangement causes less friction and wear than by the old method, where these threads had to be passed through the heddles. One very important feature is that the carriers at all times remain in their place between the warp-threads and are sure to work without catching and becoming easily destroyed, as has heretofore been the case by the use of the old method in doup-weaving. The wear of these carriers is reduced to the minimum in working back and forth over the fingers or guides as they are raised from and practically carried over the guide-fingers by the tension of the binder-threads which engage them.

Transportation in Textile Mills. Arthur Koechel, Berlin, Germany, has recently brought on the market a tram way adapted for transporting material in textile mills. It is said to be cheap, convenient, and to occupy a small amount of space.

As a proof of the antiquity of soap as an article of commerce, a soap maker's shop has been discovered in the ruins of Pompeii.

DIFFERENT KINDS OF KNOTS.

BY EDMOND LECLERC.

The accompanying diagrams show not only the different kinds of knots used by weavers, but also several employed for various other purposes. Fig. 1 is a square knot and used for fastening two ends of a thread together. Fig. 2 is a weaver's knot and serves the same purpose as the preceding one; it has the advantage of not slipping, and does not form a thick place or bunch in the yarn. It is the most solid knot and preference should be given to it in textile mills. Fig. 3 is a draw knot, used for splicing broken warp threads in the loom; its construction permits the desired tension to be applied to the thread. Figs. 4, 5 and 9 are various forms of slip knots used for tightly binding bundles and other objects. The knots shown at Figs. 6 and 8 are frequently used for mounting heddles as they enable the cord to be shortened or lengthened as desired. Fig. 7 is a knot used for uniting several threads in one loop. Fig. 10 shows a combination of knots used in connecting the levers of a loom with the shafts. Fig. 11 is the mason's knot, used for fastening rope to objects to be lifted or drawn. The more the rope is pulled the tighter the knot becomes.

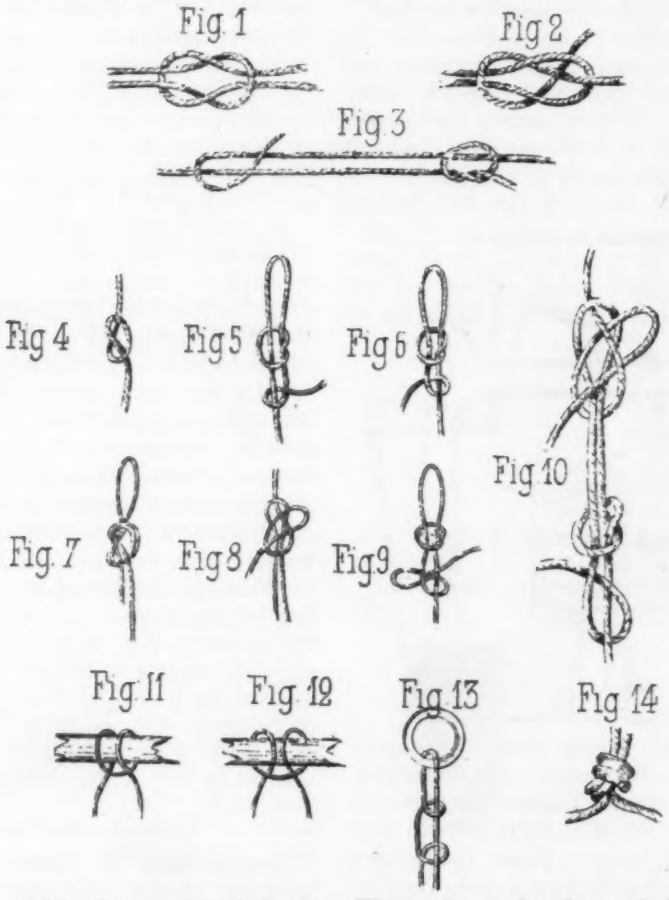


Fig. 12 is another form of slip loop, but it is not as good as that at Fig. 11. Fig. 13 is the mariner's knot used for suspending heavy weights and well adapted for large rope. Finally we should not forget the apprentice's knot, Fig. 14. Its size and the facility with which it slips make it unworthy of use anywhere.

FINISHING WOOL AND MIXED FABRICS.

XXV.

BY N. REISER.

(Copyright, 1904, by Lord & Nagle Co.)

SPONGING.

This is a process of treating woolens to prevent their shrinking when sponged by the tailor or when worn as a garment. The process consists of dekatising and steaming. The ordinary steaming to remove press lustre shrinks the goods and thus to a certain degree takes the place of sponging. Very few mills make unshrinkable goods from pure wool. In fact, this unshrinkable quality is required for but few kinds of goods. In early times cloth was fulled for one or two days and the resulting product was practically unshrinkable. At present, however, many wool and half-wool cloths are fulled but very little. Fulling is not adapted for worsted goods with a clear face, as it would destroy the clear effect desired and cause streaks in the cloth. Ordinary dress fabrics are not required to be unshrinkable as is the case with military cloth. In order to make a piece of woolen goods absolutely unshrinkable it is necessary:

1. To full as long as the fabric will shrink.
2. To dry the piece under a loose tension and not stretch it on the tenter bars.
3. To press hot under great pressure in a hydraulic machine. The rotary press will stretch cloth from 2 to 5 per cent.
4. To wind the cloth under slight tension on the dekatising roll. If wound tight the cloth will stretch, and shrink afterwards.

It is an error to assume that unshrinkable goods, as the term is ordinarily used, cannot be shrunk by additional fulling. To test this I made the following experiments: A piece of white cloth made from pure Buenos Ayres wool was scoured, then fulled for two hours in a rotary machine and again washed. By this process the cloth shrunk 9 per cent. in length and 11 per cent. in width. After drying the piece it was dekatised for two hours, left standing on the roll for four hours and then steam brushed. A portion of the piece was then fulled for an hour in a hammer mill, by which it was shrunk 10 per cent. in length and 5 per cent. in width. After this piece had been washed and dried it was dekatised for one hour, left on the roll four hours and then immersed in boiling water for fifteen minutes. No shrinkage occurred in either length or width during this second dekatising and steaming process. It was then fulled for one hour with acid and shrunk 6 per cent. in each direction. The remnant of the piece was laid on a wire frame over boiling water for fifteen minutes, and then fulled for one hour in acid. This caused an additional shrinkage of 3 1/3 per cent. This abnormally severe treatment left the cloth as hard as a piece of leather, and shows that the ordinary process of fulling employed in our mills is very far from making the goods incapable of further shrinkage by fulling.

The public have a right to demand cloth that can be worn without shrinking so much that the garment must be discarded after a few weeks' wear because it is too small. This requirement can be met without making the cloth unfullable. The question now arises whether the requirements of the consumer can be met with goods that are not fulled. The answer to this is yes and no. It is possible if the cloth is wound loose on the roll and dekatised until the fibre is made brittle. This treatment is very injurious to the fabric and the slack winding causes water marks. Under ordinary conditions, however, the dekatising process will not entirely prevent subsequent shrinkage of cloth. In order to come as near as possible to making cloth unshrinkable the following conditions are necessary:

1. The cloth is stretched in length as little as possible in finishing.
2. It should be well pressed and dekatised.
3. The pieces should be repeatedly steam brushed while lying slack on the roll. The steam brush should be arranged to keep the cloth exposed as long as possible to the steam.

Fig. 124 shows a perspective and a sectional view of the steaming apparatus of a steam brush. The cross section shows the arrangement for carrying off the condensed

water. (a) is a perforated steam pipe. Above this pipe are placed a number of bars, i i', against which the steam strikes, arresting the passage of the condensed water, which drops

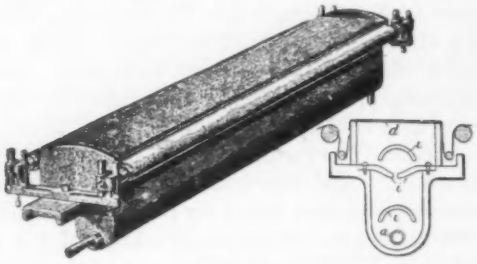


FIG. 124.

back to the bottom of the apparatus and runs off through a drip pipe. The top of the box is covered with wire cloth or perforated sheet copper, d, on which several thicknesses of jute or other cloth are tightly fastened. The cloth to be steamed passes over this covered box and is then exposed to the steam, which forces its way through the covering. With this apparatus it is necessary to bring considerable tension on the piece.

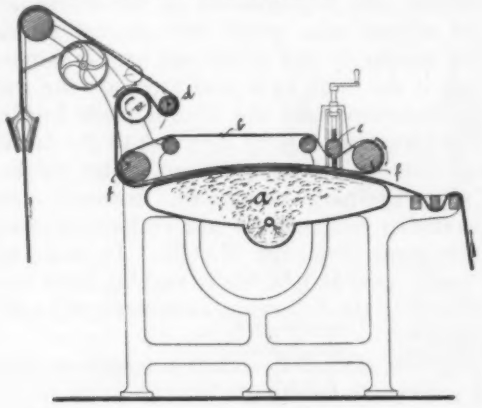


FIG. 125.

Fig. 125 shows a steam machine designed to avoid a tension on the cloth. The steam passes into the chamber, a, through the top of which it passes to the cloth. An endless felt apron, d, carries the cloth along by slight pressure and without tension. The roll, c, revolves in the opposite direction to that in which the cloth is moving, and serves to polish the face of the goods. This machine is also built without the endless felt apron, which is quickly destroyed by the heat and steam. When the apron is dispensed with it is necessary to draw the cloth through the machine, causing more or less tension. Even then the machine has the advantage of exposing a large surface of the piece to the action of the steam jet.

(To be continued.)

TEXTILE CONDITIONS IN ENGLAND.

(Specially written for the Textile World Record.)

The land of Uncle Sam is today engaging the full attention of textile Yorkshire and Lancashire, and as far as one can judge there is every appearance of your states figuring conspicuously for some time to come. First and foremost there is the cotton embroglio which is taxing Lancashire's patience to its utmost, while in Yorkshire the big wool shipments which have lately been made have fairly taken the wind out of the sails of some who thought that the consumptive capacity of American mills had reached their limit. However, one never knows what is going to take place, and the last evidence of life of American mills has given manufacturers in this country to see more fully the growing importance of American mills both in cotton, wool and mohair. Even the last mentioned raw commodity has surprised not a few of our Bradford mohair dealers, for the article here is as flat as ditchwater with hardly a pack a week moving out of hands, and yet for months past there has been more buying in Bradford on American account than on account of anybody else, last month's shipments being no less than £6,246, an item which at the present low prices ruling means a fairly large quantity of mohair.

I just mention these facts to show your readers that on this side the herring pond we have many evidences of the advances which are being made in the textile world on your side the Atlantic, and this means growing competition between the two countries, with an ultimate ousting of the British manufacturer from United States markets.

Dealing first of all with wool, we find that there is a greater strength in the raw material than in anything else, good greasy

combing wool being comparatively dearer than the combed article. The fact seems notorious that the price of "tops" in Bradford is lower than anything else, and top-makers are loud in their complaints that they cannot make ends tie, do as they will. Just think that I can buy today a super 60's top at 46 1/2c. and possibly 46c., but good clean Australian wool is costing that figure, and this is what is making men disgusted with the Bradford market.

Yarn spinners are practically in the same boat, manufacturers offering them prices on an equivalent of 44c. to 45c., hence nothing more than a mere carrying-on from hand to mouth is the daily experience in merinos. The real crux of the matter is an absence of demand for the manufactured article, and not until there is some improvement on this score shall we see any change in the market for tops.

I do not know what is the general feeling in merino circles in America, but there seems to be a little more hopefulness here, the continued strength of crossbreds seemingly being sufficient to give one the impression that fine wools are going to be rehabilitated. In high class circles there is soon a change from one thing to another, and if a dress is worn three months the cry is heard for the next latest, and as royalty has once again patronized Bradford made dress fabrics of a merino order, we may see merinos slightly improve. The Prince and Princess of Wales officially opened the Cartwright Memorial Hall which was formally opened by Lord Masham, the head of Manningham Mills, and the decree went forth in the press that the Princess of Wales would be glad if her friends would buy Bradford made goods this season and so help forward home industries. She placed an order with Priestley for their latest in fine dress goods, so to be in the fashion American ladies in wearing Priestley dress fabrics know that they are only imitating the Princess of Wales.

So far the season has been very poor indeed for dress goods, this having a very bad effect on the market for fine tops and yarns. The weakest part of the whole structure continues to be the quietness there is in our wholesale dry goods houses, repeats being very poor and trade extremely quiet. The weather has been very unseasonable, with an abundance of rain.

Crossbred wools stand in a far different light to merinos, and here there is much more doing. Some seem to think that prices for low crossbreds are about twelve o'clock, and that they cannot possibly advance much further without seriously crippling the consumption of crossbred wool. The rage for something cheap is the sole reason for the present run on coarse wools, and with good support coming from your side for even English grown wools, business continues fairly good in this department.

The March shipment of wool from Bradford made a record under the Dingley tariff, and £95,495 is a big total. A good deal of support is being given by woolen manufacturers, and if Bradford yarn exporters to Germany could only get their clients to advance their offers 2 cents per lb., crossbred wools would not look behind them this year. As it is prices are expected to be maintained next series in London, 40's tops being worth today 25 1/2c., 36's, 24 1/2c., and 32's, 23 1/2c.

Cotton seems to spread forth its wings in eagle-like fashion, and to dominate everything. The Sully failure was greeted with much rejoicing in Lancashire as well as Yorkshire. The extremely high prices for the raw material have compelled Lancashire spinners and manufacturers to set their house in order, nd to devise means for annulling as much as possible the evil effects of the cotton corner. It's an ill wind that blows nobody any good, and largely through Sully's influence the British Cotton Growing Association are making efforts to procure an increased supply of the raw material, and there is every indication of beneficial results accruing.

The short time movement is continuing to spread, and I do not think that 20 per cent of the spindles and looms of Lancashire are going full time. C. W. Macara says that since last September the consumption of cotton in Europe has been reduced by 700,000 bales. New England going on short time has given every satisfaction. Mr. Macara thinks that by persevering with the present policy Ameri-

can and Liverpool "bulls" will shortly have to relinquish their present position, and that new cotton will ultimately fall at least 2c. per lb.

There is yet plenty of territory for American manufacturers to conquer in the cotton trade, for not above 20 per cent. of the product of the looms of Lancashire is sold for consumption in this country. When the war in the East is settled China and Japan will be in want of cotton goods. As can only be expected, the business in the raw material is limited to the supplying of actual requirements, a hand-to-mouth policy being regarded as the safest and the best. Buyers of yarns will not place any orders because they expect lower values later on, and all foreign orders are reduced to lowest dimensions possible. Lancashire has lately shipped some fair weights of cotton goods, but these represent orders placed when prices were much lower than they are today, and all authorities seem agreed that later on in the year there will be a marked falling off because foreign buyers will not pay today's prices. The value of cotton yarns exported for March showed a value of £667,419, against £658,-415, or an increase of 1.4 per cent.; cotton piece goods, £4,948,229 against £5,014,349, or a decrease of 1.3 per cent.; woolen goods show an increased shipment of 15.2 per cent.; and worsted cloths a decrease of 15.9 per cent. Taking the textile trades of this country in their entirety there is nothing whatever to boast about.

Carding and Renovating Machine. Walker and Smith, Batley, Yorkshire, Eng., have brought out a machine, operated by either hand or steam power, for opening and renovating wool, hair or other fibre to be used for upholstery purposes.

Automatic Dyeing Machine. Obermaier & Co., Lambrecht, Germany, have recently brought out an improved automatic dyeing machine specially adapted for the dyeing of raw stock, top, warps and yarn on cops with the sulphur colors. It is said that five or six thousand pounds of yarn can be colored on the machine in one day.

THE WARPING ROOM.

BY THOMAS BARR.

Perfect yarn can be so dressed as to cause a small production in the weave room and a large proportion of seconds in the finished goods. This is especially true of colored work, concerning which I want to say a few words. The dressing department is not up to the highest standard in many of our fancy colored mills of today. Superintendents and agents are often ignorant of the system in this department if indeed they have a regular system.

In many of the mills all the authority is vested in the slasher man with hardly any notice taken of him or his work by the overseer. The slasher man makes out his own tickets, putting on each the pick, sley and number of filling to be used and a lot of other information of more or less value to subsequent workers. He lays the pattern in the reed to suit his own fancy rather than the weaving of the warp. I know some men who with a stripe pattern eight pink and two white will lay eight threads in one dent and two in the next. This will make the white yarn tight and cause many breaks. When the slasher man makes out his own tickets there is no limit to the number of warps that he is to make per set and every extra warp causes an extra expense. Where the men are paid by the day they are required in many mills to continue their work until ten minutes of stopping time regardless of the making of extra warps or pieces. Many rooms contain 10 or more slashers. They would average 18 extra warps per day. These at a drawing price of 35c., which is a fair average, means a loss of $6.30 per day, whereas had they stopped on the full beam they might have lost on the average one hour each and this at the rate of $2.00 per day would amount to $2.00. Which is the better way?

It is my belief that a man should be paid for the quantity and quality of his work, which means that he is to be paid at a fixed rate per set for perfect work and nothing but perfect work should be accepted. A slasher man on fancy colored work is worth $2.50 per day and if he is not worthy of this he is

not one that I should want around very long. A case came under my notice in which an experienced slasher man was hired in a small mill to run slasher mostly on ticking. After 3 months' time it was noticed that the production was greater from weave room and this continued until the weavers were making so much that the agent reduced the pay 10 per cent. Shortly after this they lengthened the cuts five yards. How much would such a slasher man be worth?

The best system for running a colored dressing room is yet to be found, but as a general rule the following method has been a success where it has been carried out. The yarn should leave the balling room so as to reach the beaming department in completed sets. After beaming each set is placed by itself near the slasher, the slasher man receives his pattern or set from the overseer and with his helper puts it into the slasher. He receives his tickets from the overseer all made out with any special instructions that are needed. After the set is started the second hand or overseer should look it over to see if correctly laid in and sized right. The name of the slasher man is marked on each ticket. The number of frame does not answer as well because a spare hand is often put on for a day, and in such a case it is difficult to tell who is responsible for bad work.

Many agents do not realize that every week and sometimes in one day in our large mills there are from 25 to 50 warps returned to the dressing room because of carelessness of the slasher men and the poor oversight of the overseers. There should be a system established whereby the agent and superintendent should know how many warps were returned and who was responsible. Mills that do not get 80 per cent. from their weave room and a very small percentage of seconds had better investigate this matter.

Madder has been employed in connection with the so-called Turkey-red process of dyeing from time immemorial. In the sixties its production amounted to 70,000 tons per annum, but of late its use has declined to such an extent that the plant is no longer worth cultivating.

A CUSHION SHEAR REST.

A shear rest with a felt cushion for preventing knot holes in the cloth has recently been patented in this country. Rubber cushion shear rests have been in use for a number of years, but the inventor of the felt rest claims that the rubber rest does not entirely prevent cutting of the cloth when a knot or bunch passes under the blade. He claims this is because the material of such cushions does not yield locally to the knots, but forms a somewhat extended dished depression which appears in the sheared nap as a raised spot. The cushion formed of felted fibre

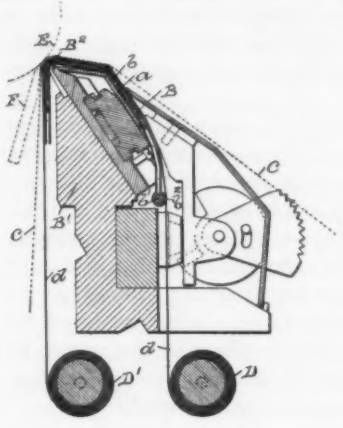


Fig. 1.

Fig. 2.

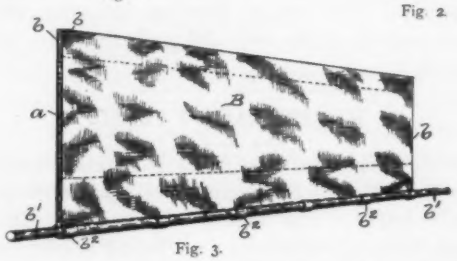


Fig. 3.

interposed between the cloth-rest and the cloth knots and other imperfections in the weave will, he claims, cause the cushion to yield locally, so that an even surface of the cloth is maintained and the nap is shown evenly, presenting a finished surface.

Fig. 1 is a sectional view of a cloth-rest for cloth-shearing machines provided with the felt cushion. Fig. 2 is a transverse sectional view of the apron. Fig. 3 is a perspective view of the apron.

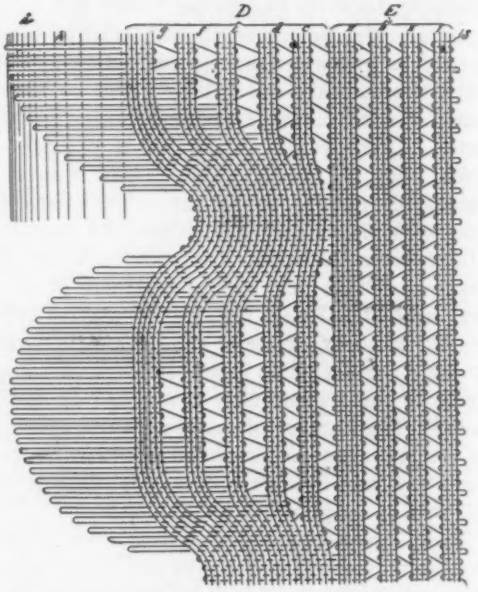
In the drawings (a) indicates a sheet of felt formed by felting fibrous material into a sheet of uniform thickness. In the preferred form the sheet of felt, a, is secured between the folded sheet, b, of cotton cloth forming the apron, B, the fold of which is secured to the rod, b^1, by means of the clamps, b^2 b^2. The clamps serve to hold the sheet on the rod and also engage the sheet, d, as it travels over the cloth-rest. The apron, B, extends from the rod, b', over the cloth-rest and around the nose, B^2, of the same, being held in position by the sheet of cloth, d, usually smoothly finished silesia cloth, extending from the roll, D, over the apron, B, to the roll, D'. The cloth, c, to be sheared is indicated by a broken line. The shearing-cutter, E, is indicated in broken lines, as is also the shearing-blade, F.

The felt is made of short fibre. The sheet may be of such thickness as will best support cloth of the weight required to be sheared. The felt may be made of any desired density, so as to form a more or less yielding cushion. It is claimed that the felt cushion when used on a cloth-shearing machine differs in its action from rubber or similar cushions in that knots or imperfections in the weave of the cloth depress the cushion locally, because the fibres of the felt yield laterally and support the cloth close up to the knot or imperfection in the weave, thereby insuring the even cutting of the nap and uniform finish of the cloth.

A WOVEN LACE FABRIC.

A German idea for imitating hand made lace on a loom has recently been patented in this country. The method of making such laces comprises more or less broad border, a partly-open, partly-closed woven middle portion and an arc-shaped bottom. In order to make the border or upper portion of the lace, the warp-threads, which are governed by heddles, are bound by the picks of weft, while for the formation of the middle portion or pattern groups of warp-threads are arranged which, being carried in other heddles, are put closely together or drawn asunder, so that there are formed striped patterns changing with spots or the like objects. For making the arc-border the weft-threads are carried over a number of warp-threads, which being raised and lowered allow loops to be made, said warp-threads being removed afterward.

In the accompanying illustration the portion marked E represents the border of the fabric, which is of usual construction. D is the middle portion. It consists of a number of warp-threads which are arranged in groups, as shown, and which may be at will drawn apart or put together, so that a spot may appear in the fabric, as shown. The



border is formed by the weft-thread, which returns over more or less warp-threads, so that loops are formed by the weft and the border is shaped in arc form.

The pattern-forming threads, I, II, III, IV, of the border, E, lying in groups, are bound, for instance, by the pick of weft, s, which, passing first the threads I of the group E, then passes the threads II, binding them thrice and also binding in the same way the threads III and IV. In the same manner the weft-thread, s, crosses the groups, c d e f g, of the warp-threads, D, forming then a long loop, h, for which purpose it passes a number of warp-threads, i, that have been not raised. After returning over the last of these threads, i, the same are raised, so that the loop, h, is made. Now the weft, s, runs in

the same manner back to the threads, I, and so on to and fro, forming with the threads, E, the upper border, with threads, D, the pattern, and by means of threads, i, the arc. The pattern is formed, as before described, by adjusting the groups, c d e f g, with decreasing arc, which takes place by employing a smaller number of threads, i. The groups of, D, are gradually closely put together, thus forming a spot.

In order to allow the weft to be laid in the fabric as described, the shuttle is driven in the usual manner by a pinion and a rack, and the latter is connected in any suitable manner to the jacquard-machine, which, according to the pattern, controls the movement of the shuttle by the jacquard-cards, so that the shuttle is driven a more or less long way through the fabric. Instead of a jacquard-machine there may be with the same effect other means used for reciprocating the shuttle to lay the weft.

NOVELTIES IN ENGLISH FABRICS.

By our Special Correspondent.

The market in raw materials is no less difficult. Demand, to say the most of it, is no more than normal. Supply is clearly short. Nobody pretends that there will not be wool enough for every yard of cloth likely to be wanted, but relatively there is a shortage and less wool of colonial production will be carried unsold at the end of the season. Hence holders hoist prices dangerously high and scorn the idea of an imminent fall.

Merinos are unmistakably in more demand for dress goods that are yet to be made. Consumers of crossbreds by delaying purchases are doing all they can to bridle the advance. Farmers are obtaining from 25 to 30 per cent. more for English wools than at the same time in 1903 and spinners of such wool declare it is selling for as much in the market as yarn spun from it.

Though at the moment the men's wear trade is between seasons, it appears certain that the next winter will be less favorable to tweeds. Producers of indigo serges anticipate a livelier demand than for a long time. Common blues will follow. Blacks and blues are now passing in fair quantity through merchants' hands and a reduction in the proportion of fancy goods will be welcomed.

Small neat over-checks upon a broken line-stripe foundation are expected to figure in new patterns. Green and red threads are to be used as well as more sober hues. A remarkable cloth for autumn wear is now in high-class tailors' windows under the name of "Game Plumage Homespun." It is for wear by sportsmen in Norfolk and similar suits on the moors. Its origin is Scotch and the effect does imitate the markings of the grouse. There are several shades of rich browns in which the figuring runs diagonally. The lighter threads are massed together in grotesque forms somewhere between the triangle and the crescent in shape. Deeper heather mixture stands between, and a fairly faithful and conventional repetition of the original plumage is obtained which is handsome enough at short distance and should be nearly invisible against dark backgrounds at long range.

The struggles of Bradford makers to defeat the Continental competition in plain dress cloths have been sufficiently advertised. Something has come of the endeavors; half a dozen different Amazons and buckskins have been made. These are not cheaper than French and German goods; they are firmer and stronger and more satisfying in weave. Some imported yarns are used and generally speaking, heavier numbers than the Continent employs are preferred. For cheapness, a darker and slightly inferior backing-weft has been introduced into some cloths. The incentive to make these goods is that they sell at all seasons and in all years in steady quantities. In order to obtain fine shades the unnecessary use of oil is avoided and only the finest and most readily scourable kind is used at all.

The merits of Yorkshire dyeing are involved in the production of these new cloths. It also is in process of improvement. The quantity and quality of work done are now superior to all precedents. More pieces with fewer men are turned out, and in quite an American spirit of enterprise new machines

are adopted, old ones "scrapped" and workmen hustled. Incidentally, it may be pointed out that direct electric driving becomes all but universal in the dyehouses.

A new loom for the production of belting is now being exploited. It combines some of the characteristics of the sewing-machine. Multiple needles put in the filling as the warp runs from the spools across the "needle bar." Speed is the primary advantage claimed, as time is saved that ordinarily is wasted by the transit of the shuttle. Seventy-five feet per hour of six-inch belting, three-quarters inch thick, is said to be the record of its production. The inventor of the Hyatt wick machine which produces some 200 feet per minute of one-inch lamp wick is responsible for the loom.

From South Africa and elsewhere mysterious reports of a process for dry-cleaning wool have come in. Infusorial earth (Kiesel-guhr) was said to be used for abstracting grease. It appears that in Germany the system has been carried a stage further. Patents have been granted to protect the use of infusorial earth driven by a powerful air-blast upon the material for treatment. Importance is attached to the dispensing with strong alkalies, but nothing definite is known yet of the degree of perfection attained.

The annual export of yarns, fabrics and apparel from the United Kingdom now approaches $600,000,000, being by far the largest group of all its manufactures for export. The oversight of this gigantic turnover falls to the Board of Trade, a government department that is to be rechristened the Ministry of Commerce. Substantial increases of salary to the minister and his deputies are proposed, but no real reformation of the department has thus far been suggested by our rulers. That is not so extraordinary. Our legislative barnacles are contending that the office of minister would be much better filled by some other than a business man and that a total absence of business qualification is of the utmost advantage to the holder of the post. In the trust that the humor of this pretention will be appreciated to the full by American readers, the information is passed on.

MEMOIRS OF A VETERAN MASTER MECHANIC.

BY EBEN GOULD.

(Continued from May.)

Mr. Dewso being out of health left the mills early in the spring of 1866. Mr. Smith acted as superintendent for about one year, leaving in 1867. James Verloren came as agent, and of all the ten agents that I worked under while in these mills he was the only one with whom I could not get along. Do what I would I could not suit him. At that time, John Sunderbock was acting superintendent.

Soon after Mr. Verloren came, he began going into the fireroom and finding fault with the firemen and ordering them about. Now I had been having full charge of all the engineers and firemen, as well as all the outside men. I had two good men in the large fireroom, who always kept the steam up to the right point. One day one of them came to me and said that the agent had brought a new man into the fireroom, and discharged him, saying that the new man would take his place. Now the agent had never said one word to me that he had a man he wanted to put in as fireman. I said to Welch, the old fireman:

"You go home and stay there until I send for you."

I did not go to the agent, I went direct to the fireroom, found the new man and asked him if he could keep up steam. He was right on his ear. He said:

"I did not come here to learn to run boilers or to fire. I don't want any one to tell me a thing about firing. I know all about it."

"Good for you," I said, "you shall have it all your own way."

It was late in the day after the heaviest steaming was over so he could get along, but I knew that the next morning there would be a different story to tell. I called Kennedy, the other old fireman, and said to him:

"You do just as he wants you to do, but you need not show him how to fire, for he knows it all, so you will do as he says."

I left them at that. The next day about 8

A. M., Mr. Sunderbock, the superintendent, came to the shop and said:

"Gould, what is the trouble with the speed? The looms are all stopped and the shafting is not going at half speed."

"I guess the new fireman has more than he bargained for and cannot keep steam up, so as to keep speed on the engine," I replied.

We went to the fireroom. The new man was punching the fires and sweating bad. I said to him:

"What is the trouble? Your steam seems to be going down out of sight."

He hadn't a word to say, but went and sat down. I went to my old fireman Kennedy and said:

"Let us get this steam up."

In a short time steam was up and the engine going at full speed. I then told the new man to try it again. The next day it was the same thing. Mr. Sunderbock wanted to know why the steam got so low that the machinery had to stop. Then I told him how the agent J. P. ——, had discharged my old fireman and put that new man in his place, and that in the fore part of the day when the dyehouse was drawing all they wanted, it was more than he could do to keep it going.

The third morning it was the same. Mr. Sunderbock came to the shop and said:

"Is there no way to stop this trouble?"

"Yes," I said, "I think that this will be the last of it. It is just this, Mr. Verloren caused all this bother and he will have to order it stopped."

This time I went first to the engine, Mr. Bowen with me. I shut off steam, stopping the mill and then went into the fireroom and said:

"Come boys, get up steam, for the agent will not want the mill stopped a great while."

"What," said Mr. Bowen, "are you going to keep the mill shut down until the men get up steam?"

"That is just what I am going to do. I hope you do not think I am going to come in every day to get up steam with the engine and dyehouse both drawing steam. You may go to the agent and settle that between you. He put this new man in and discharged my old one. Now I will not come in and rouse up this steam again."

After we got started again, the agent came to me and said:

"I guess this man will hardly do, will he?"

"You can see how it has been for the last three days," I replied, "if he suits you I won't say a word, only I shall not do any more firing."

"What shall we do?" he asked.

"You put this man to work, you may put him out. You put the old fireman out, you can put him back."

He sent at once for Welch to come to the office, but he would not come. Then the agent came to me and said:

"Welch will not come."

"I will go and see him." I said.

So I went and said:

"Well, Welch, I want you back in your old place."

"I will not go to work for Mr. Verloren," he said.

"I do not want you to work for him, I want you to work for me."

I soon came back, Welch with me, and went direct to the fireroom. Mr. Verloren took his man away at the same time, and I think if he ever worked at firing he must have had some one to teach him, for when at this mill all he seemed to know was to shovel coal into the furnace door, which is not all that is required for making steam. This ended the trouble about low steam. I told Mr. Verloren what I had said to Mr. Welch, and that he had better let me manage the firemen.

Cross Border Jacquard Motion. Thompson, Rogers & Co., Belfast, Ireland, have recently placed on the market a new cross border jacquard motion for which various advantages are claimed.

Cap for Wet Spinning and Twisting Frames. J. & T. Boyd, Glasgow, Scotland, have recently brought out an improved cap for wet spinning and twisting frames designed to prevent the wet threads from sticking to the side of the cap. The cap is made with a number of outside rings which keep the thread from coming in contact with the flat surface of the cap.

AN IMPROVED DRAWING FRAME FOR COTTON.

At the present day draw frames are usually fitted with four sets of heads, while in the roving and allied frames the number of heads is generally three. Each head consists of a lower, fluted metal roller, and an upper roller covered with some yielding material, the two rollers touching each other only along a single generating line. The lower roller is caused to revolve, and communicates this motion to the upper roller (in a reversed direction) by rolling friction, since the upper roller is pressed down on the lower one by means of weights attached to the ends. Naturally these weights forcibly press the yielding cover of the upper roller into the flutings of the lower one, and consequently exert a pressure on the cotton between them. The leather on the pressure rollers is rapidly worn out, and the rollers become hot and electrify the sliver, causing some of the fibres to adhere to and be carried round the upper and lower rollers.

In each pair of rollers there are two primary functions to consider: (1) The nip, properly so-called, of the cotton; and (2) the transmission of motion from the lower roller to the upper one exactly at the point where the nip is exerted on the cotton. The first of these functions can be ensured without difficulty, as the action takes place between a metal surface and an elastic one. If the second function, as performed in existing frames, could be suppressed and modified in such a manner as to impart motion to the upper roller in some other way than by rolling friction at the nipping point, then the first function would be more satisfactorily discharged and the cotton would be exposed to nothing more than a useful strain, without being the intermediary for transmitting the pull of the lower roller to the upper one. There is no doubt that the result of the effort of transmission is to weaken the fibre of the cotton and to incite the generation of electricity.

Observing spinners have already asked themselves whether this defect could not be remedied by driving the upper roller from the lower one by means of pinions keyed to the cylinders and calculated proportionately to their respective diameters. The attempts made in this direction, however, had to be abandoned, owing to the fact that at the end of a very short time the leather and cloth became flattened under the influence of the pressure, so that the diameter of the upper roller became slightly diminished and caused it to slip on the lower roller. This made the leather wear out much more quickly than before, for it wrinkled and became unfit for use.

In a new frame which has been specially designed by F. ter Weele, Saint-Die, Vosges, France, to meet these disadvantages, the lower rollers are quite smooth and polished their whole length, as shown in Fig. 1. The upper rollers still consist of iron cylinders covered with cloth and a facing of leather, so that up to this point there is nothing new but the abolition of the flutings on the lower rollers. The upper roller, however, instead of running, as hitherto, in fixed bushes, carries on each of its gudgeons a rotary bush of hardened iron (D, Fig. 2). This bush is formed of two barrels of different diameter, the larger one carrying a small pinion, G, cut in the metal of the barrel and engaging with a second small pinion, F (Fig. 1), cut in the metal of the lower roller outside the ends of the frame.

These two pinions are not fitted with an equal number of teeth, but are usually geared in proportion to the diameters of the respective rollers. Thus, for example, the inventor uses a 20-tooth pinion for a 1 1/4-in. roller, and an 18-tooth pinion for the pressure roller, the diameter of the latter being consequently $32 \times 18 \div 20 = 1\ 1/8$ in. (theoretically, of course). In practice the diameter is made a small fraction of an inch larger in order to preserve the play of the teeth and keep them from touching in the bottoms, and also to ensure a higher peripheral velocity than that naturally resulting from the pull of the lower roller. The reason for this will be explained later on. The smaller barrel of the rotary bush, D, works in a fixed bearing, L, (Figs. 1 to 4), or lubricating collar, which is itself mounted in the ordinary manner in the pillar, B, by means of two sliding plates, Y, which

can be raised and lowered. The fixed bearing, L, is also fitted with a circular groove, X, to receive the hook carrying the weight, as in the ordinary frame.

The working of the system is as follows: So far as the transmission of motion is concerned the pressure roller, C, is subjected to two distinct efforts:

On the one hand, by reason of the movement of rotation imparted to the rotary bushes, the roller is turned by the frictional contact between the gudgeons and the bushes, D. The considerable relative movement is of itself sufficient to move the upper roller at a higher peripheral velocity than

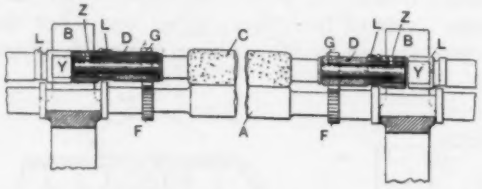


Fig. 1.

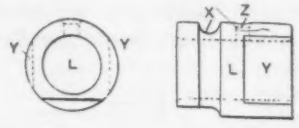


Fig. 3.

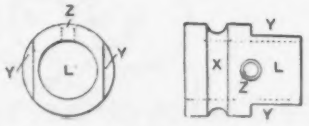


Fig. 4.

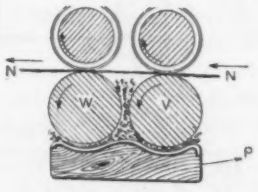


Fig. 5.

smooth roller. Hence the roller, C, is acted on by two forces, which tend to turn it at two different speeds simultaneously. It is therefore evident that a certain amount of slip must arise in one or the other methods of transmission, in order that the two peripheral velocities may coincide. This slip occurs between the inner surface of the rotary bush, D, and the surface of the corresponding gudgeon of the pressure roller, these two surfaces being well oiled for the purpose of securing this result. Herein lies the whole secret of the invention.

It is therefore evident that in practice the leather on the roller, C, is not subjected to that of the smooth lower roller. This can be tested by placing under the fixed bearings, L, and without removing the weights, small wedges that are just thick enough to move the roller, C, out of contact with the smooth roller, A, without disengaging the gear pinions. If the machine be then started, it will be seen that the roller, C, turns at a peripheral velocity corresponding to its diameter and the number of teeth in the gear wheels.

On the other hand, on removing the wedges, the pressure exerted by the weights on the fixed bearings, and consequently on the pressure roller, C, causes this latter to be carried round by the lower roller at an equal peripheral velocity. But it has already been seen that the velocity imparted to the roller, C, by the two pinions is slightly higher than the motion it receives from contact with the any peripheral traction for the purpose of causing it to revolve, but on the contrary, is exposed to a slight effort in the opposite direction, causing it to assume the theoretical velocity of the lower roller. This slight effort on the leather is, therefore, in the opposite direction to that intended to effect the drawing of the fibres, consequently the leather is no longer exposed to more than a portion of the total effort necessary for the operation of the drawing, the two efforts partly neutralizing each other. The leather covering on the roller no longer has any tendency to stretch and work loose on the cloth underneath, a tendency which is one of the chief causes of bad drawing and necessitates frequent renewal of the leather.

Of the other advantages of the system the chief is that the cotton is no longer crimped under the influence of the flutings and the

impressions made by these latter in the leather; hence there is considerably less electrical excitation. At the same time the quantity of nap carried off by the smooth metal roller is said to be considerably less than with the old fluted rollers, the amount given being about one-fourth. As regards the method of cleaning the first two smooth rollers, W and V, the fixed cleaner, P (Fig. 5), has been abolished. This is one of the chief causes of lumpy sliver, and unless cleaned up at very frequent intervals the nap collects, as seen in Fig. 5, and eventually fills up the entire space between the rollers, W and V, underneath the band of sliver, N, so that small quantities of nap are every now and then carried away by the sliver. Instead of the fixed cleaner the first and second drawing rollers in the system, however, the rollers, M, are longer than the working face of the rollers, W and V, consequently the nap is removed by the cleaner roller as fast as it collects and cannot be seized by the passing sliver.

The pressure cylinders having no longer to come in contact with a fluted surface, remain smooth, and are easily cleaned by means of two large rollers, H and J, Fig. 7, of very light wood or cardboard, covered with plush and resting on the pressure rollers. These cleaning rollers collect the nap in the form of a regular layer of felt, free from lumps or thickened places. The axes of H and J (Figs. 8 and 9), slip into recesses, S, in cast-iron blocks, T, which are screwed on the underside of the cover, V, so that when the cover is removed by tilting it on the hinges pro-

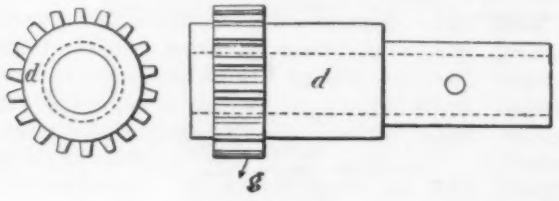


Fig. 2.

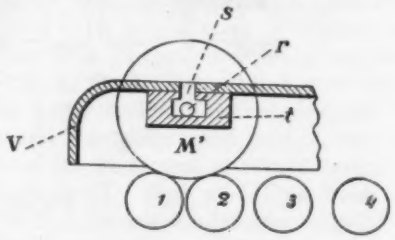


Fig. 8.

new system are cleaned by means of a wooden roller, M, about 2 inches in diameter, which is covered with plush and placed under the rollers, against which it is kept pressed by a counterpoised lever, R (Fig. 6). The iron gudgeons, U, of the roller revolve on a smooth surface, T, of the lever, and can be oiled. The nap is taken up in a very uniform manner by the plush facing and can no longer be carried off by the sliver; consequently it is no longer necessary to clean out under the rollers, W and V, so often, it being quite sufficient if the nap is removed from the roller, M, once a day.

Moreover this roller presents another important change. In the ordinary frame small beards of nap collect at the ends of the working surface of the heads, more particularly on the second fluted roller. When these tufts grow to a certain length they come in contact with the next set of rollers, and are thereby brushed off, falling partly on the machine and partly on the sliver. In the new vided at the back end of the frame, the cleaning rollers are raised at the same time, and return automatically into position on their respective rollers when the cover is lowered again.

Another question is that of the weights—a very important and hotly-contested point. The usual plan adopted by frame-makers is to load the rollers with a 20-lb. weight at each end, or 40-lb. in all for each roller. In the present system, however, the weighting is considerably reduced. Tests have been conducted on this point at the spinning works of Messrs. Witz and Feltz, of St. Michel-sur-Meurthe, where the Ter Weele draw frame is being used side by side with the newest frames of the ordinary type, on the same class of cotton. These tests were performed under the following conditions:—

The Ter Weele frame has a working surface of 18 1/8 in.; doubling and drawing, 8; sliver, No. 26 per .5 metres; setting of the heads, 32, 36 and 42 mm. (1 1/4, 1 7/16 and

1 5/8 in.); Louisiana cotton, good middling, 1 1/8 in. (28/29 mm.). The first roller is weighted with 11 lbs. at each end, 22 lbs. in all, the total pressure on the succeeding rollers being 33, 37 3/4 and 42 lbs. respectively. These pressures are the same for all passages. When the pressure on the first roller is raised from 22 to 39 1/2 lbs., the cotton is lowered in quality and puffy, thus showing that a

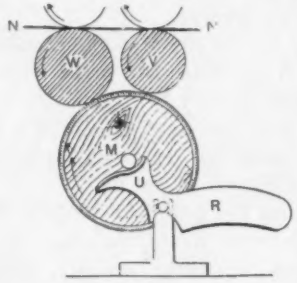


Fig. 6.

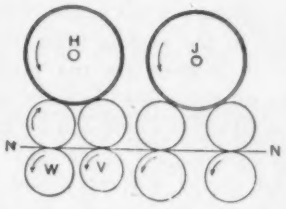


Fig. 7

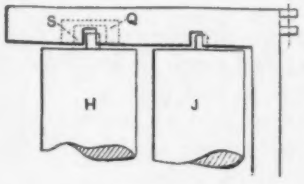


Fig. 9.

pressure of 22 lbs. is quite sufficient to ensure good work.

On comparing the cotton drawn by the new frame with that treated in another frame by the same maker, but provided with the ordinary fluted rollers, the former is found to yield a sliver of superior quality as regards the parallelism of the fibres, more uniform, and furnishing a round yarn free from damage. The working speed of draw frames in general varies considerably, according to the width of the working surface and the degree of draft required. Thus, when the heads are 15 inches long and the doubling 6, the frame can be run at a higher speed than with 18-inch heads and doubling 8. Some spinners of Louisiana cotton run 15-inch heads (roller diameter 1 1/4 in.) at 450 revolutions, equivalent to nearly 49 yards a minute of good middling cotton (1.1 inches) doubling and drawing 6. This represents about the maximum speed. Usually for 18-inch heads and doubling 8, the highest speed does not exceed 360 to 400 revolutions per minute for the first head (1 1/4 in.)—i. e., 39 to 44 yds. a minute.

Attempts made to run at higher speeds are attended with an increase in waste and loss of time in stoppages, owing to the augmented electrical excitation, the consequently increased clogging of the cleaning flats and rollers with nap, greater tendency to form beards of nap on the rollers and deposits of similar fluff near the condensing funnel. With the new system it becomes possible to largely increase the speed of the drawing rollers without incurring the aforesaid defects at such an early stage. Thus, at 600 revolutions there is less accumulation of nap on the flats and cleaner rollers, and there are smaller beards, than with ordinary frames running at 400 revolutions. There is also less nap in the vicinity of the funnel.

Some tests have been made with the new frame running at 800, 1000, and even 1200 revolutions per minute (for the first roller). It should be mentioned that at the last two speeds, which were only used to demonstrate that the frame would continue to work satisfactorily, two heads only were worked out of six, it being found necessary to stop the alternating movement of the stop-motion spoons, which no longer worked properly. The exact speeds attained were 803, 1021, and 1240 revolutions. The drawing was identical in appearance and quality with that obtained at a speed of 400 and 500 revolutions, without any appreciable increase in the amount of nap, and there were no breakages or beards. The weights were left unchanged (11 lbs.), and it was only on reaching the speed of 1240 revolutions that it became nec-

essary to add 2 1/4 lbs. at each end, thus raising the total weight to 25 1/2 lbs. for the first roller of the last head, which jumped with the 22 lbs. This jumping is easily understood, as in the frame in question the end of the front roller drives the second by means of pinions connected by an intermediate wheel situated beneath.

After numerous trials, 450 to 600 revolutions are recommended as the practical limit of speed, for even at these speeds the frame, in addition to turning out better work, is said to afford a saving of labor and general expenses sufficient to quickly wipe out the cost of replacing the ordinary rollers by those on the new system. The ordinary pressure rollers can still be used, provided the gudgeons are turned down to a diameter that enables the rotary bushes to be fitted.

One of the first objections urged against this frame was the probable wearing out of the pinion teeth; but on this point it is sufficient to say that the effort needed to turn the rotary bushes is extremely slight for well-oiled pinions of hard iron, and is no greater than that to which the leather covering of the rollers is exposed in the ordinary frame. Hence there is nothing to wear on this point, and indeed during the whole of the six months' trials the teeth edges exhibited only a slight polish on the parts in contact. The small pinions are completely covered by sheathing and protectors so that no risk is incurred by workers in charge of the machine.—The Textile Manufacturer.

HOW TO FIX THE BRAMWELL FEED.

BY SAM DRIVER.

Uneven drawing makes uneven roping; uneven roping makes uneven yarn. The great cry in most mills is uneven yarn; this is about the first thing the new carder will hear. There is no trouble about the stock not being carded well, the greatest trouble is to get the roping even and to keep it so.

In the first place to make even work, the stock must be evenly prepared, mixed and oiled before it comes to the card room. The Bramwell feed should be set level and on a line with the first breaker. The top of the feed table should be set a little below the center of the bottom feed roll and one-half inch from the feed roll. If the stock is crowded in the feed it will make heavy drawing; if it gets too low in the feed it will make light drawing. Two extremes. To make even drawing the stock in the feed box should be kept at one height as near as possible, and replenished a little at a time and often; when putting in stock do not press it down; let it have its own weight.

Putting in too much roping waste at one time and in one place will make uneven drawing. Waste should be pulled up some and mixed in with the stock a little at a time, just enough to keep up. It should be mixed in every time the stock is put in.

Sometimes the points of pins on the apron get covered with waste, making uneven feeds and uneven drawing: remedy, keep clean. The pins on the side of the apron get broken off by setting the comber too close, set the comb farther off and have the pins replaced.

This sometimes is the cause of the feed being heavier in the middle than the sides. If the stock is heavier on the middle of the cards than on the sides the grate on the bottom of the Bramwell feed can be easily taken down and cleaned out every lot. This grate is good for shives, leather, wood, wire, etc., to drop through, and these articles will often be found on the grate. These sometimes get caught on the apron pins, causing the apron to stop.

See that the attachment that operates the slat pusher and comb to and from the apron as the stock in feed gets low, is in working order. When the stock is low in the feed the comb should move farther off the apron, when in working order.

When a lot is running out and the stock in feed gets low the feed tender should be on hand or some very uneven drawing will be made. If the catch slips when taking off the large apron take it off and file it; at the same time file the ratchet pully teeth on apron shaft.

Setting the comb too close to the apron and running it faster than necessary will break the staple. Motto: Save the Staple.

Do not run any large apron faster than

need be; sometimes the feed tender when wiping feed will knock the feed off before balanced, causing uneven drawing. That is the reason for "Hands Off" painted on the scale. The writer has often seen very uneven drawing made by the scales dumping before they were balanced. Remedy, speed the apron faster or set the comb further off the apron.

Automatic feeds are made adjustable and if properly adjusted can be made to do good work. When the catch inside of ratchet gear clicks after the scale is balanced, tighten up the little friction snap on the end of the large apron. If using a large per cent. of shoddy, or cotton mixed with wool, the pins on the large apron will naturally carry more wool than of the shoddy or cotton. This will make uneven drawing that can be remedied in two ways: First, by setting the comb further off the apron; Second, by placing a board 3/4 inch thick and 12 inches wide inside the feed under the comb. Set the comb down to the lowest point, then set the board up to within 4 or 5 inches from the apron pins. Place the lower end of the board 5 or 6 inches from the apron pins. The edges of the board should be planed to a bevel.

With this appliance the stock will be laid more evenly on the pins and make a more even feed. The feed box must not be too full or uneven drawing will be the consequence.

With the arrangement for stopping the two aprons at the same time after the scale is balanced, a much more even drawing can be produced with the Bramwell than formerly.

The small apron or fan is the most neglected part of the Bramwell feed and still it is one of the most important parts in getting a nice, even feed. This apron should always be in good order and set up to pins on long aprons just alike. The stock in both ends and middle of scales will be alike. The writer has found this apron in all kinds of shapes, making very uneven drawing.

BALANCING THE SCALES.

On one side of the feed is the scale beam, on which is a movable weight. On the other side of the feed is another scale beam with balancing weight. Place both weights at an equal distance on the scale beams on both sides until the scales are balanced; when balanced, tighten the balancing weight, which will be stationary; then move the movable weight back according to the quantity of stock you need in the scales. Set the scale pans so that the bottoms will come evenly together at both ends, don't have them overlapping each other. If the bottoms of the pans are crooked, take them out and straighten them.

The balancing points, which are V-shaped studs attached to scale beams, should be kept sharp. The accuracy of weighing depends on these points. The V-shaped sockets bolted on side of the feed for the V-shaped stud to fit in, should be kept clean and oiled. See that every nut and bolt is tight. A large amount of uneven drawing is made after the stock leaves the scales by having the scales too full and too heavy a feed. Never have the scale pens more than two-thirds full on any kind of stock or for any size of yarn to be made.

For example, we will change off from 5 run fine wool to 2 1/2 run coarse light wool. If we alter the weight on the scale for this the scale pans will be heaping up full and so would the feed table. This would make uneven drawing, but we must not alter the scale weights until we see how full the scale pan is going to be. If the scale pan fills two-thirds full it is just right. Don't have it more nor less than two-thirds full under any circumstances. Bring up the weight by altering feed gears on card. The pushboard on the feed table should be set back so that it will not push the stock under the beater. When the stock drops from the scale it should drop on the edge of the last feed forming a splice. It is where this splicing is that causes uneven drawing and also causes the drawing to break down. Do not have the beater too low. Many little things amount to big things; even yarn cannot be made from uneven drawing.

The red cardinal cloth used by the high prelates of the Roman Catholic church has been made for many years by a family of Protestant manufacturers in Aix la Chapelle, who alone possess the secret of making this after the requirements of the Vatican.

YOUNG MEN IN THE MILL.

BY GAMALIEL GAUNT.

It is a well-known fact that young men are rapidly becoming the heads of all our industrial enterprises, and many are graduates of textile schools. One may ask if the young men who have gone through these schools are as well fitted to take charge of a mill as one who has worked his way up from the bottom. Opinions differ on this point, but I believe that the young man with the school training will make the better man in the end. As a rule, the man in the mill is confined to the room in which he is working, and it is not unusual to find a man who knows nothing of any other department even after he has been in a mill for fifteen, twenty or even thirty years.

There are always some that seem to be satisfied with weaving, or spinning, or doing some other odd job, and they never try to get anything better. These are the men that cause most of the trouble in the mills. They say that life is hard and everything is wrong and everyone can get ahead but them. This state of mind leads to careless, imperfect work. If all the people in a mill would exercise the proper care in their work, mill owners would be able to make considerably more money each year, with the result that the operatives would have better work, more of it and better wages.

The discontented workers look at the overseers and second hands and everybody with a better position than they have as beneficiaries of a "pull." There are plenty of good positions still open for those who are willing to work for them. One cannot take up a paper without reading an advertisement for a first-class man in some line of work. Men are wanted who knew their business and such men can always command good wages. The mill owners are not trying to grind the working people down, but the working people are doing their best to bring the employers down by their carelessness and inability to do their work properly.

Why are employers putting young men at the head of departments? It is because they find a young man with ambition is able to keep up with the times. The last few months have brought me letters from men all over the country, saying that no one can get a good position unless he has some one with influence behind him. This is not so. There are a good many men in high positions who got there by their own efforts. They had no 'pull," but they made up their minds to better their condition; they worked hard and their work led to success. The same privilege is open to all. Talk less; do more work and do it well; don't make up your mind if you get eight or nine dollars a week that you will do just eight or nine dollars' worth of work; don't try to do as little as you can; remember that the employee who never does any more work than he gets paid for, never gets paid for any more than he does. Be honest and earnest and ambitious. It is in doing the small things, the looking after details that make a man valuable, and one may be sure if he does his best that it will not be his own fault if he fails.

AMERICAN SILK.

No industry in any country has made such great progress as silk manufacturing in America during the last twenty years. It leads all other countries in respect to the amount of silk consumed. It passed France in 1900 and since then has constantly increased its lead. In 1902 America consumed thirteen million pounds of raw silk, or more than one-third of all the raw silk produced throughout the world. In the same year France consumed but eight million pounds.

Double Cloth. Otto Fritze, Gruenberg, Germany, has patented a process for making double woolen cloth without stitchers. Cotton yarn is used for the stitching threads and after the cloth is woven and fulled the cotton is removed by carbonizing. The face is held to the back by the felt. This process can be used only for well felted woolen goods and even then its value is problematical owing to the danger of the face separating from the back.

Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

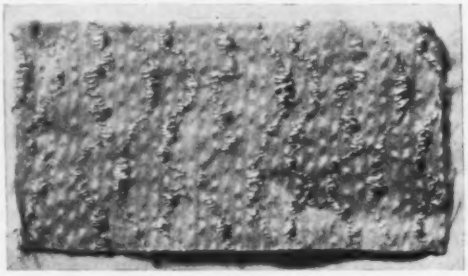
For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Finishing Crepon.

Editor Textile World Record:

I have read with much interest the Question and Answer on finishing crepons in the July issue. There are two methods of getting a crepe effect. One is the well known method of giving the warp and the filling an extra hard twist. As soon as the cloth is wet the filling contracts and draws the cloth into wrinkles.

There is another method used in all the large print works in Europe and the United States. It consists of mercerizing in spots or lines, causing the cloth to contract where the caustic lye is applied and leaving the other parts unchanged. The goods are printed on a regular printing machine,



using a cloth or other suitable roll, with a resist which is usually made of gum tragacanth solution. After printing the pieces are mercerized in the usual manner, the parts of the fabric having the resist printed on them are left untouched and the unprinted material is mercerized, thereby causing contraction in spots. The accompanying illustration shows a sample of goods made by resist printing and mercerizing and is only one of the many varied and beautiful effects obtained by this process.

Baumwolle.

Dyeing Denims.

Editor Textile World Record:

Under this heading, "Dyeing Indigo," I see an error in your July issue. Synthetic indigo is less expensive today to use than any aniline color or even a sulphur color, as it costs only about $1.25 per hundred to produce a good denim shade which would cost at least $1.40 per hundred with any sulphur blues anywhere near as bright as indigo. Indigo denims today bring from 1/8 to 1/4c. per yard more than any sulphur or aniline blue denims. I should consider it very risky for anybody to make anything but indigo denims as the competition this coming winter will be so great that nothing but the best standard goods will sell and the standard in denims today is indigo. Any commission man would tell you the same.

Top Notch.

Dyeing Blue Denims.

Editor Textile World Record:

The answer to our question in your July issue does not give just what we want to know. Is there any advantage to the consumer in a denim dyed with indigo over one dyed with diazotized developed blue or sulphur blue?

Blue Denim (445.)

The advantage of indigo in dyeing denims is that it is cheaper, shade for shade, than the anilines and besides, owing to the generally hard usage to which this class of fabrics is subjected, it resists much better than the latter dyes. There are a few blue cotton colors that are faster to light than indigo, but their cost is somewhat greater and the ultimate results of wear, washing and general durability are not nearly as good. In dyeing denims where the best results are desired the use of artificial indigo is strongly recommended, as it is superior to natural indigo in being free from those impurities that tend to impair the shade and assist the crocking.

Beta Naphthol.

Kiln Cloth.

Editor Textile World Record:

Can you tell me where I can buy kiln cloth used for drying purposes? It is made of hard twisted flax or jute yarn with an open mesh to allow the air to pass freely through it, and it is very durable.

Kiln Cloth (447).

If any of our readers are interested in this inquiry we should be pleased to put them in communication with our correspondent.

The Best Opportunity for Economy.

Editor Textile World Record:

What process of manufacturing carded woolen goods offers the best opportunity for effecting economies in the cost of labor by improving the machinery or process?

Inventor (452).

This question suggests an interesting subject for discussion not only as related to the special branch to which Inventor limits this inquiry, but to the manufacture of cotton, worsted and silk goods. The question might be profitably broadened to include the cost of supplies, fixed charges and selling expenses. The question as presented above is discussed in another part of this issue.

Speed and Size of Pulleys.

Editor Textile World Record:

Please give me a simple rule for calculating the speed and size of direct connected pulleys?

Manitoba (450).

Suppose two pulleys, A and B, are connected by a belt. Then:

Diam. of A × speed of A = diam. of B × speed of B.

From this it follows that:

Diam. of A = (diam. of B × speed of B) ÷ speed A.

Also that:

Speed of A = (diam. of B × speed of B) ÷ diam. of A.

Ex. A 12-inch pulley running 150 r.p.m. drives another pulley 225 r.p.m. Find size of the last named pulley.

(12 × 150) ÷ 225 = 8 inches, diam. of pulley running 225 r.p.m.

Ex. A 15-inch pulley running 80 r.p.m. drives a 10-inch pulley. Find speed of the last named pulley.

(15 × 80) ÷ 10 = 120 r.p.m. of 10-inch pulley.

The circumference may be used in place of the diameter if desired.

Slipping of the Filling on the Warp.

Editor Textile World Record:

We are making goods with 27 threads per inch in each direction for warp and filling, woven with a 4 by 4 basket weave. During the washing process the filling slips on the warp giving the cloth a wavy appearance. Fulling the goods before washing has not removed the difficulty. What is the cause of this slipping of the filling, and how can it be remedied? Ein Deutscher (411).

This question appears in Das Deutsche Wollen-Gewerbe, and is answered by N. Reiser as follows:

It is practically impossible to make a smooth, perfect fabric with hard twisted yarn having an open set and as loose a weave as in the fabric referred to. With the greatest care the filling will slip out of place by reason of the friction during washing, fulling and pressing. I would make the following suggestions regarding the difficulty:

1. In case a stock of goods has already been woven, send them to a chemical scourer to be cleaned by first winding on perforated rolls and then forcing benzine through the pieces. The goods are then pressed in a hydraulic machine.

2. In place of the regular 4 by 4 basket weave, use that shown at Fig. 1. It gives practically the same pattern and prevents the slipping of the filling.

3. Make the goods by the French method, which consists in the use of a cotton binding thread in warp and filling as shown at Figs. 2 to 6. Fig. 2 is the weave generally used. The cloth is dressed and woven 1 wool 1 cotton. Fig. 3 shows this method adapted to a 3 by 3 basket weave. Fig. 4 is a 4 by 4 basket weave with every third thread a cotton binder. Figs 5 and 6 show the 4 by 4 basket weave with every other thread a binder except at the junction of the basket figures at the beginning and the end of the weave, where two wool threads come together. By this arrangement the number of binder threads is reduced one-fourth.

4. Try the weaves shown at Figs. 7 and 8 in which the binders are in the warp only. The threads marked with black squares are woolen, the others cotton. After weaving, the goods are washed, fulled and gigged if necessary. They are then carbonized, if wool dyed by the aluminum process, and then finished. It might be well to press in the hydraulic instead of the rotary machine. Figs. 7 and 8 can be changed as shown at Figs. 9 and 10. The carbonizing can then be omitted.

"Prove all things; hold fast that which is good."

Bleaching Cotton and Wool Goods.

Editor Textile World Record:

Can you give us a method for bleaching cotton and wool goods with a sulphur bath?

Cripple Creek (434.)

An experienced finisher replies to this question as follows:

To bleach cotton and wool goods in a sulphur bath, the goods should be perfectly clean and the bleaching may take place in the washing machine after they have been thoroughly cleansed. When all trace of soap has been removed the water is shut off and the pieces left to drain for about five minutes, the gates being open during this time. The gates are then shut and enough water run into the washer to cover the goods. A bath is then prepared as follows: To each 100 pounds of goods to be bleached, take about 6 gallons of bisulphite of soda, and add to this about one pint of sulphuric acid. Divide the bisulphite of soda, putting about a gallon into a pail and then fill with water. Divide the sulphuric acid equally among the six pails and stir well. Start the washer and then add the bleaching mixture as described by pouring in slowly, but not directly on the goods. Run the goods for about 20 minutes in this bath, then open the gates and turn on the water for rinsing. Rinse well until all the objectionable smell is removed and the surplus acid is rinsed out. Do not run more than 20 minutes in

the bleaching mixture or the strength of the cotton fibre will be impaired and the goods lose much of their strength. If the work cannot be done in 20 minutes it cannot be done at all. As soon as the goods are well rinsed they should be extracted and dried.

After such a process it is always advisable to dry the goods as soon as possible.

If this mixture should fail to give entire satisfaction, which is hardly likely, try to find which part of the fabric is not sufficiently bleached. If it is the wool, increase the sulphuirc acid slightly; if it is the cotton, increase the amount of bisulphite of soda.

Production of Woolen Weaving and Spinning Rooms.

Editor Textile World Record:

How can I estimate the capacity of a wooolen spinning or weaving room on a given fabric? We make different grades of woolen goods and the relative production of our spinning and weaving machinery varies widely on different fabrics. We have two fabrics, A and B, made as follows:

A. 3,000 ends 3 1/2 runs; 68 inches in loom; 50 picks 4 1/4 runs.

B. 2,400 ends cotton warp, which we buy; 80 inches in loom; 40 picks 3 run, spun at mill.

How can I estimate the number of looms that our 4,000 spindles will keep supplied with yarn on each fabric? Amazon (451).

Estimating a warp take-up of 10 per cent. for B, and a filling take-up of 5 per cent. for each fabric A and B; speed of looms 80 picks per minute; average daily production of yarn per spindle, 1 2/10 runs on yarn for A and 1 run on filling yarn for B; daily production per loom 19 yards A or 22 yards B; waste, 5 per cent.; the calculation is as follows:

Fabric A:

3,000 (end) ÷ .90 (100% — 10%) = yds. warp yarn per yd. 3,333

3,400 (68 × 50) ÷ .95 (100% — 5%) = yds. filling per yd. 3,579

6,912

6,912 (yds.) × 19 (yds. cloth) = 131,328.

131,328 (yds.) ÷ .95 (100% — 5%) = 138,240 yds. yarn per loom per day (86 runs).

86 (runs) ÷ 1.2 (runs) = 72 spindles for 1 loom.

4,000 (spindles) ÷ 72 (spindles) = 55 1/2 looms.

Fabric B:

3,200 (40 × 80) ÷ .95 (100% — 5%) = 3,368 yds. filling per yd. of cloth.

3,368 (yds.) × 22 (yds. cloth) = 74,096.

74,096 ÷ .95 (100% — 5%) = 77,996 yds. filling per yd. of cloth (48 runs).

48 (runs) ÷ 1 (run) = 48 spindles for 1 loom.

4,000 ÷ 48 = 83 1/3 looms.

Assuming the estimate of production, take-up and waste to be correct, the 4,000 spindles will keep 55 1/2 looms running on fabric A, and 83 1/3 looms running on fabric B.

Cheese Cloth for Flour Bags.

Editor Textile World Record:

What processes are required for bleaching and sizing or fulling cheese cloth for flour bags?

Home Made (441.)

In the bleaching and sizing of cheese cloth for making flour bags the work has to be done at a minimum cost of time and labor. Instead of following the methods usually adopted for bleaching finer fabrics, such as cambrics, etc., the usual practice is to use a machine of the continuous washer type which is provided with several compartments for holding the various solutions required. The bleaching is carried out in one operation by first entering the dry cloth at full open width in the first compartment, which contains a boiling caustic soda solution, then successively through the various compartments containing a solution of chloride of lime, wash water, sour or acid bath, and hot soap, after which the cloth is run on the cylinder dryers. After drying the cloth is passed through the padding machine for the application of the sizing material, which is composed of starch, China clay, paraffine wax and boracic acid, or other non-poisonous material, and dried in the usual way on the cylinder dryers.

Palmetto.

Difficulty in Dyeing Aniline Black.

Editor Textile World Record:

We are coloring hosiery aniline black. Sometimes lots dyed with the same batch of liquor will vary, some being soft and others harsh and sticky in feel. What is the cause of the variation?

Malacca (449).

An expert in the use of aniline black answers the above question as follows:

"The difficulty is probably due to defective rinsing of the goods after chroming. They should be rinsed thoroughly until all trace of acid is removed. If any acid remains fatty matter will naturally adhere to the goods during the process of soaping. It is advisable to add to the soaping bath a very small amount of soda and then rinse well. By following this method we think Malacca will have no more trouble."

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 232 to 253. Also Buyers' Index.

KNIT GOODS SITUATION.

The situation at the present time is not a pleasant one for the manufacturer, nor for that matter, neither is it pleasant for the buyer. Considerable business has been placed on lines for Spring, 1905, but now a break is here and it is a case of the manufacturer going about naming lower prices than those of two weeks ago to secure orders, and notifying buyers who had already purchased of the lower prices in order to hold the sales already made. This has some effect on the buyers, and they are either holding off entirely or placing conditional orders, having little confidence in the quotations made at the present time.

Certain numbers of ladies' straight ribbed goods have been reduced from 2 1/2 per cent. to 5 per cent. since the lines were opened, and the opening prices were the same as last season. Ladies' shaped goods that were sold last season at $1.90 are now being offered at $1.85 and it is reported that some orders have been accepted on the same line at $1.82 1/2.

A break has occurred in men's balbriggan in the lower grade and some numbers that were opened at $1.90 have been reduced to $1.82 1/2, and those weighing 5 to 5 1/4 pounds opened at $2.00 are now offered at $1.90.

On the better grades of men's balbriggans to retail at 50c., there has been no change since the lines were opened, but the opening prices on most of these lines were from 2 1/2 per cent. to 4 per cent. lower than last season's prices, and according to manufacturers' and selling agents' stories, these prices will not permit of any further reductions.

The larger Western buyers are now in the market and while the volume of business so far placed is less than at this time last season, yet these buyers are now getting under cover and making purchases for self protection. They realize that they must get their samples and start their travelers on the road by September 1st, notwithstanding the unsatisfactory condition of the purchasing market.

A line of ladies' straight ribbed vests to retail for 25c. offered for spring shows some great advancement on the part of our domestic manufacturers and it will bother the German manufacturers to produce higher priced goods that will show a difference in values to the consumers.

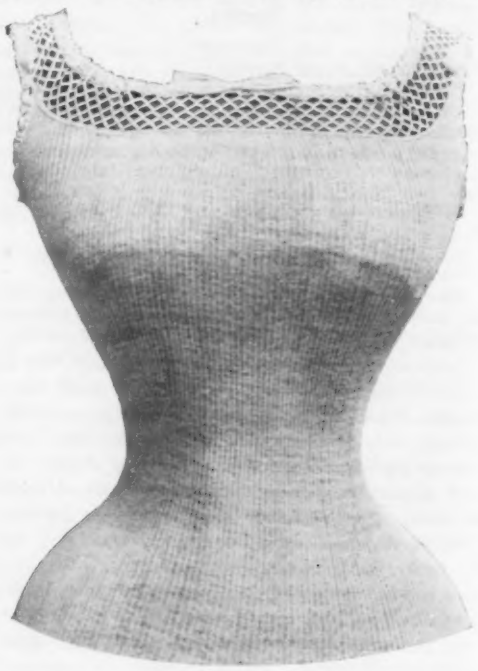


FIG. 1.

The Southdown Knitting Co. have in their line some exceptionally good sellers in lisle thread goods made on Swiss machinery, both in Richelieu and two and two rib with all silk trimming at $1.90. These compare very favorably with the German made goods that cost in the neighborhood of $4.00 per dozen to land, and these manufacturers report having taken a very nice business on these lines.

They also show another line made of sea island cotton with mercerized trimming at $1.75, which buyers are taking very freely.

In fancy trimmed goods, the call is for those styles made with Nottingham lace trimming principally and some very sightly styles are shown so made.

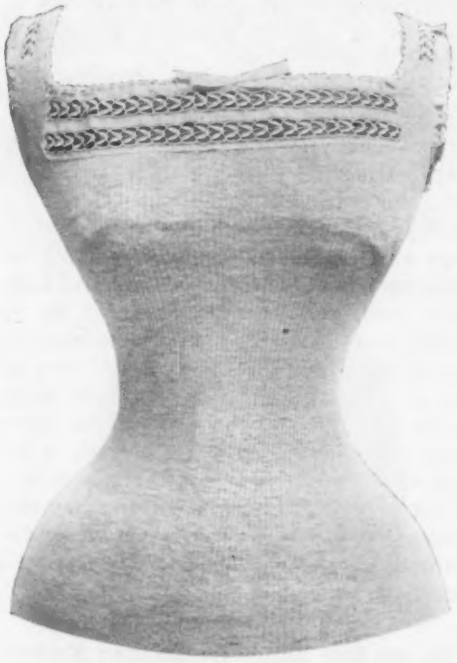


FIG. 2.

We illustrate at Fig. No. 1, a vest shown by Bateson & Dowd at $1.75 net and at Figs. No. 2 and 3, vests shown by Schreve & Adams at $2.00 regular. We are informed that buyers have selected these styles quite freely.

The raw material conditions do not warrant any break in prices of fall goods, but other conditions have brought about a feeling among some manufacturers that they can afford to take some business now at less than prices asked during February and March, and as a consequence, it is now possible to buy ladies' ribbed goods, weighing 6 to 6 1/4 pounds at $2.00 and $2.05, and we learn of one Southern made garment being offered at $1.90.

Men's fleeced goods on which the February price was $3.75 are now offered at $3.62 1/2. On the other hand some manufacturers have declined to make any concessions in prices, although they are not sold up, but they defend their position by saying that to name lower prices when there is no demand would but tend to demoralize the market.

It is reported that an attempt has been made to get the fleeced goods manufacturers together to prevent a dropping of prices, but that it has not been successful. Many fleeced mills are running on short time and others will undoubtedly be doing the same before long, as trade on fleeces has flattened out and very few manufacturers are sold up for the season.

HOSIERY.

Hosiery trade is active at the present time and the spring lines are meeting with a fair amount of success. Prices are the same as

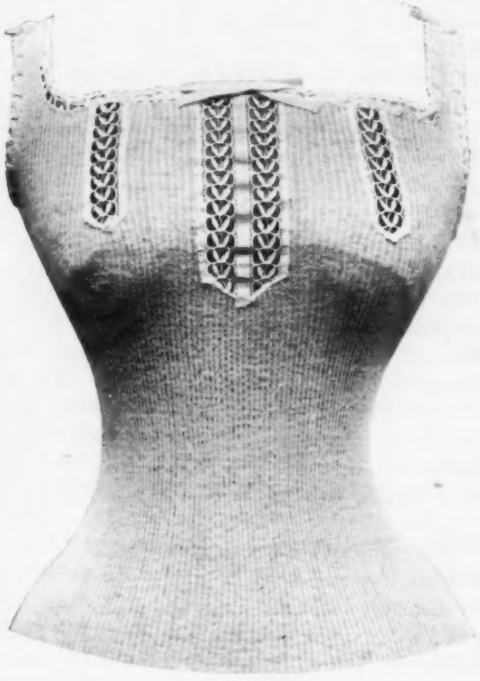


FIG. 3.

last season on the majority of lines, but from 2 1/2 to 5 per cent. lower on the low numbers.

The heavy end of the orders being placed

is on blacks and tans, and tans are called for in medium and light shades.

One manufacturer is showing a line of fancy styles to retail at 25c., but they are so extreme and startling that buyers are not taking them. They consist of wide and graduated bayadere stripes of high colors on tan, blue and black grounds with drop stitch fronts and are, as one buyer expressed it, enough to give the wearer the nightmare.

Another manufacturer has a line of tan and black and blue and black mixed grounds with printed dots, and, while slightly more subdued than the above mentioned line, yet we fail to find any buyers who are sufficiently well pleased with them as to place any orders.

CHEMNITZ REPORT.

Trade in hosiery is in a satisfactory condition and most manufacturers have orders enough to keep them busy for some time. Some few are complaining, but these have machines for making striped goods or other styles which are not popular. Prices will remain firm, even if the yarn markets should fall off somewhat which, however, is not probable, as all spinning mills have contracts which will last away into the fall. The difference will be offset by an increase of wages which is sure to come if the orders continue to come in, as they are now doing. Wages, at the present time, are very low and will not stay on this basis if trade keeps up, which it undoubtedly will do, as most of the leading buyers will be in the market sooner than usual this season. One reason for this will be the fancy hose question, as during their last stay in town they did not place large orders on this line and by the time they are here again, will know better what is going to take.

Plaited goods for men are in good demand, but are not called for in ladies' goods, except in a few styles with small hand embroidered effects. Striped goods are not taking at all for ladies, but are in good demand for men's wear. In embroidered goods a number of decidedly new styles have been shown recently by a new maker who only recently started in business, but already has large orders on his books. All maco feet hose for ladies are not as much in demand as in former seasons, but orders for split feet are coming in very rapidly, especially in the low priced ingrain split foot; the production is sold ahead for a long while. Orders for dyed leg goods may yet be placed, but values offered by different manufacturers vary a great deal. Some have not made any change in their prices, while others claim they are not in a position to sell old standard qualities any more.

In lace goods the principal sellers will be the grades that reach the market at $4 and $4.50. The very low priced lace hose are disappearing from the market and at the same time are not much called for, as the quality is rather poor. The very gauzy effects are less called for than formerly and while very fine gauged goods are still selling fairly well, they are now wanted in nice closely woven goods made on fine machines, instead of the cobweb effects which were selling so well last season. Fine light weight goods are now bought without the spliced seam and with the heel spliced only a very little above where it is joined to the foot, so as not to show when worn with a low shoe. Gold printed goods in small neat designs are again being shown as novelties to retail at 50c.

Electric Stop Motion for Knitting Machines. The Quaker City Stop Motion Co., 23d and Hamilton Sts., Philadelphia, is bringing out an improved stop motion for knitting machinery, which has recently been patented. It is claimed to be an improvement over mechanical appliances used for this purpose. Not only is it a stop motion for broken threads, but also stops for holes, bringing the machine to a stop for a broken needle. The electrical device is claimed to be durable, simple and readily adapted to all classes of knitting machinery, being easily installed and applied, and with its use, more perfect work and less waste is claimed. The manufacturers invite a trial to substantiate their claims as to its efficiency.

Coir is the tough fibrous substance enclosing the hard shell of the cocoanut, and is used extensively for carpets and mattings.

THE FINISHING ROOM OF A MODERN UNDERWEAR MILL.

BY MRS. W. H. BRAYTON.

In all the preceding departments and processes of the mill the work obtained from machinery depends more upon the adjustment of the machines than upon the operatives who attend them. In a finishing room, however, while the sewing machines need also to be adjusted properly to turn off satisfactory work, yet the ability of the operatives is more essential to the character of the work performed, and far more depends upon their intelligence, training and knowledge to produce acceptable results.

MRS. W. H. BRAYTON.

In the equipment of finishing rooms much depends upon the placing of machines for the systematic and quick handling of the work, so that each process may follow in succession. A proper arrangement of the machinery is essential to a full production from the machines. It also helps the operatives to turn out more work, makes their work easier, increases their wages and makes them more contented.

The accompanying diagram shows the plan of a finishing room for a daily production of 250 dozen men's underwear garments. The entrance is from the tower. The tables, work bins and auxiliary machinery are arranged in proper relation to each other. At the lower end of the room facing the table at the right of the entrance are two bins ready to receive work thrown down from the cutting department above.

The references on the plan are as follows: A, entrance; B, overseer's office; C, supply room; D, dressing room; E, sewing machine tables; F, work bins; G, work tables; H, aisles; I, cloth cutting machine; J, cloth folding machine; K, shelves for folded bands; L, neck marking machine; M, eyelet machine; N, chute to folding department; O, elevator; P, drying department; Q, toilet room; R, shafting and pulleys.

In placing sewing machines on the operating table it is customary to allow ample space to handle the work without crowding. A distance of four feet between the machines gives the necessary elbow room between the operatives.

The first process in the finishing room is crocheting. On the sewing machine table at the lower end are three crochet machines. The machines for the sewing or similar process are placed opposite each other, so the shirts can go down one side of the table and the drawers the other, thus keeping both styles of goods of one lot or case moving together through the various processes. All garments after cutting have raw edges, and the process of crocheting simply covers these raw edges with a neat selvage finish. These machines can be operated by girls of about seventeen years of age. They must be quick and bright so as to keep the succeeding machines supplied with work. Three crocheting machines can easily turn off a production of 250 dozen a day, and if the girls are quick and attentive they should each do 100 dozen a day.

The next process in order is seaming. Six seaming machines are placed on the table, three on each side. This seaming process consists in sewing the garments together. The seaming machine is very fast in operation; it has a trimming device which cuts as it sews, leaving a clean cut seam ready for the next process. If possible these machines should be run by operatives who understand sewing and putting garments together and they should be quick in handling their work.

Young women from twenty to thirty years of age make the best operators on this class of work.

When the seaming is finished each dozen is thrown into bins, directly behind the operators, ready for trimming. This is usually done by hand by young girls who are active and bright, but I much prefer what is known as a power turning machine. Two smart girls with one of these machines can easily take care of the entire production.

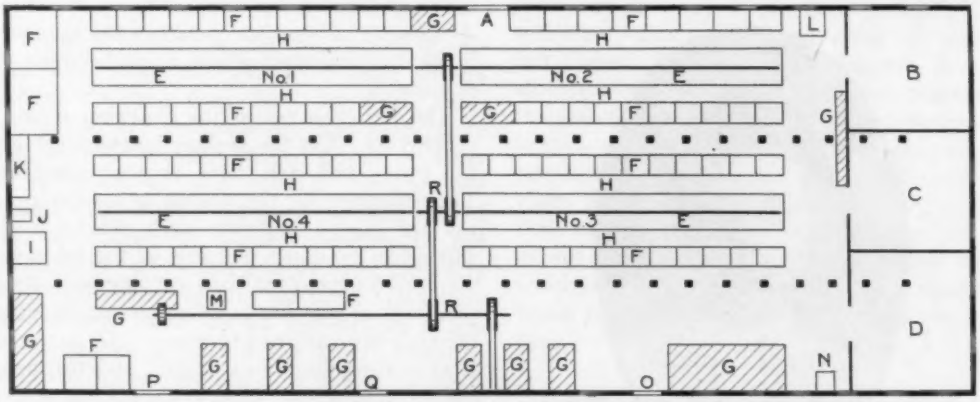
Next in order is the process of sewing the bicycle or double seats on the drawers for which finishing machines are used. It will require three of these machines placed on the drawer side of the table. This process is a very particular one and needs careful attention, and the girls who do the work must be specially quick and intelligent.

The next process is overseaming, and for this process six overseaming machines are necessary, three on each side of the table. These machines flatten and cover with yarn the seams which are left rough by the seamer, so that the raw seams on the inside of the garment cannot be seen. The girls on these machines should be careful and understand thoroughly the operation of the machines, as it is a process which requires strict attention to business.

Next is the trimming of the drawers, which is done with shears by a girl at a table back of the covering machines. This process is very easily done and consists of cutting the tops of the drawers to the required shape, ready for the finishers. The neck marking machine for the shirts is run by foot power and the operation consists in simply stamping the outline of a half-circle for stitching around and cutting out the neck. The next machine stitches around the circle marked out. Then follows the cutting out of the circle and cutting the opening down the front, preparing the garment for the finishers.

The next machine should be for stitching silk facings for the shirt fronts and suspender straps and back straps for drawers. This work is usually done by the forewoman's assistant. All the finishing machines are placed on one table, half on each side. Twenty-four machines would be required for this work and all the machines are alike. Shirt finishing consists in sewing on facings, button stays, collarettes or bindings; drawer finishing consists in putting on the bands and back extension straps if they are used. Both these processes require very intelligent operators, and upon them depend largely the character of work produced by the mill. They must be careful, watchful, and painstaking to the last degree. Young women who have had some experience in dressmaking I have found best adapted for this work.

The next process on drawers is twin-needling the bands, which will require three machines on the drawer side of the table. These machines are simple in construction and easily operated. The process consists in turning under the edge of the bands about an eighth of an inch and stitching them evenly



A PLAN OF A KNIT GOODS FINISHING ROOM.

with a double row of stitches. The suspender straps are next stitched on with a sewing machine, producing what is known as the zigzag stitch, which has an automatic attachment for stopping the machine when the right distance has been covered. Two machines are necessary for this work and should be placed next the twin-needling machines.

On the side of the table with the shirt finishing machines are the machines which give the ornamental stitch around the collarettes or across the raw seam in the back of the neck, where collarettes are stitched on the garments, if strips of narrow ribbon are not used for this purpose. Two machines are necessary for this work.

The garments are now ready for the button holes, for which three automatic buttonholing machines are sufficient. These machines make the buttonhole stitch around a certain space, then a knife drops automatically and cuts between the stitches, thus making a neat buttonhole. These machines should be run by strong young women as they are somewhat more difficult to operate than the other machines. They require both foot and knee pressure, and the operators should be hustlers of more than ordinary intelligence.

After the buttonholes are made the garments are "dotted" for the buttons. Young girls can do this work as the process consists of placing the fronts of shirts and drawers together, overlapping the under side of the garment and dotting through the buttonhole, leaving a dot or mark on the under side where the button is to be sewed. Three automatic button sewing machines are required to sew on the buttons. This is a very simple operation after the operator becomes familiar with the machine, and the girls selected to run them should be steady, rapid, and not of a nervous temperament.

This finishes the processes requiring the use of sewing machines. The work is now ready for the menders, who should be middle aged, neat and careful. They note all the holes or other defects in the garments, mend them, clip off all the loose threads and button the garments.

The shirts are now ready for inspection, while the drawers have still to pass through two other processes—eyeletting and lacing, if they are not made with back extension straps. The eyeletting is simply punching holes through the bands in the back of the drawers with an eyelet machine, which fastens an eyelet in position at the same time, covering the raw edge of the hole and leaving a neat metal hole through which laces are passed and tied. A boy is best on this machine, and two girls should be able to do the lacing and keep up the production.

The inspection process is one of the most important in the finishing department. The inspectors should be familiar with all the preceding processes and should perform their work without fear or favor, for they are the judges before whom the work of every operator must pass for approval. They are the only employees in the room who handle the garments individually after every process has been completed and they must give close attention to the work. Carelessness here may mar the reputation of the goods sent into the market. Imperfect work in any of the preceding processes should be detected and carried back for correction to the operator who is responsible. After inspection, the work is ready for the folding room where the garments are pressed, folded, and boxed ready for shipment.

There are two other machines not yet mentioned. One is a cloth cutting machine for cutting facings, button stays, suspender straps and back straps; the other is a folding and cutting machine, which folds strips of cloth to the desired size for facings, stays, etc., and cuts them into the right lengths. These machines are usually operated by a young man whose services are utilized in various capacities about the room, fixing belts, etc., and in spare moments learning to fix sewing machines.

Records should be kept of all work passing through the room, of all needles and parts for sewing machines.

The forewoman who fills this important position should be competent to instruct and train unskilled operatives. She should be thoroughly conversant with every process in

the room and able to give a practical demonstration of the work to be performed on each machine.

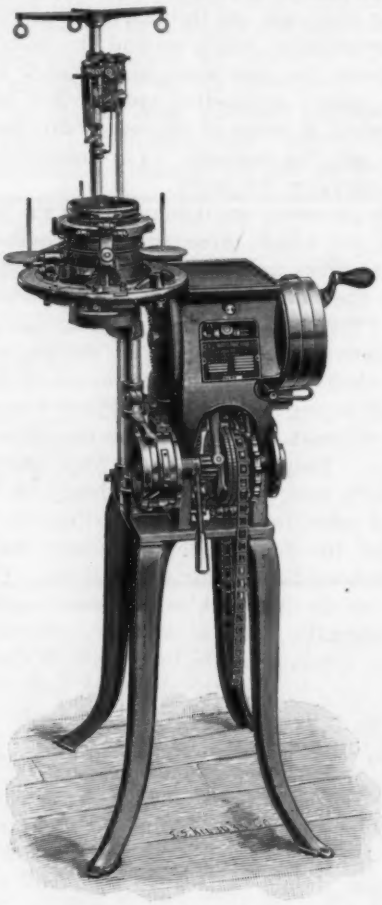
Adjoining the overseer's office is a room where all the supplies needed in the finishing processes are kept on hand. Next is a dressing room for the young women employees. Hooks for their clothing and shelves for their lunch boxes should be provided. There should be a medicine cabinet in this room for first aid to the sick or injured, and a few chairs and a couch would not be amiss. There are many other details connected with the finishing room that I would like to mention, but lack of space prevents it. I will simply add that the operatives are essential to success and deserve fair and kindly treatment. The work must be done properly and the work of each operator watched carefully. No favoritism should be allowed or familiarity permitted. This can be effected with the aid of a little tact and the respect and esteem of each operator secured. The work will then go on quietly from day to day, the production will increase, harmony exist and work in the finishing room of a knitting mill will be a pleasure.

THE GEO. D. MAYO AUTOMATIC HOSIERY KNITTER.

Hosiery knitters will be interested in the advent of the new automatic knitter built by the Geo. D. Mayo Machine Co., Laconia, N. H. The builders have aimed to make this machine simple, durable and capable of a large and perfect production. They claim it has less parts than any other full automatic machine. Among the other features to which the builders call attention are the following:

The main frame is cast in one piece which makes it rigid, strong and compact, and at the same time eliminates unnecessary weight. The gears are made with coarse teeth and wide face, and all parts subject to wear or strain are extra heavy and strong. The change from circular to reciprocating motion or the reverse is positive and made without shock or jar. The speed is controlled independent of the clutch, and is cut down just before the clutch is shifted for reciprocating, and increased immediately after it is shifted back for circular knitting. No springs are used to operate the clutch and other motions.

The needle operating means consist of but one stitch forming cam which operates the needles in both directions, consequently a perfectly uniform stitch is obtained when reciprocating the cam ring. All guides and auxiliary cams are done away with entirely, so it is impossible to bend or break needles



THE GEO. D. MAYO AUTOMATIC HOSIERY KNITTER.

or stick the cam ring. The motion of the machine can be reversed with all the needles in operation and the needle butts are in sight at all times.

The needle picking devices are very simple and work easily on the needles. They are mounted independent of the cam ring and can be removed without disturbing other parts of the head. The stitch cam can also be taken off and returned to its place with-

out removing the needle cylinder or cam ring or disturbing the work on the needles. The sinker head is self cleaning, so it is impossible for dirt or lint to collect in the grooves. The sinkers can be replaced without removing the rings or cams or destroying their adjustment.

The regular Mayo needle is used in this machine in connection with the skeleton cylinder. The latter is built up and secured permanently in the bed plate in such a manner that any of the bars can be removed and replaced in a moment without removing the cylinder. All timing adjustments of the different parts of this machine are made at the shop and the parts are securely fastened so they cannot get out of place and cause trouble. If the machine is taken apart for any reason, the parts cannot be put together again in any other than their proper positions. No set screw adjustments are used. The pattern mechanism is so simple that any operator can make the necessary changes from hose to half hose or footing in a moment. No gears and dials are used with it. It consists of a short chain with two special links and not over two feet in length for the longest hose.

All adjustments are made and all parts of the machine are readily accessible from the front, consequently they can be placed together or back to back to save floor and shaft space. The length of stitch is changed automatically at any part of the hose and to any extent desired. Independent adjustments are provided for the ankle, top, heel and toe and foot. The transfer cup is made with removable points and the operation of transferring ribbed legs or tops is more quickly and easily accomplished than on any other machine. The machine is run by one 3/4 in. belt from either overhead or floor shafting and occupies less floor space than any full or partially automatic machine previously designed. Automatic attachments are furnished for making a complete change of yarn in the heel and toe, plating, tipping and striping with two colors, etc.

The builders also desire to call attention to the novel device for introducing the thickening thread in heel and toe. It is said to be sure in operation on difficult material such as hard twisted lisle thread, mercerized cotton or silk. Instead of relying on frictional contact the reinforcing thread is knotted to the running thread.

A large factory has been equipped for building these machines and prompt delivery is therefore assured. The builders invite correspondence and will be pleased to furnish any desired information regarding the knitter.

A CONDITIONAL TAKE-UP FOR KNITTING MACHINES.

The take-up shown at Figs. 1 to 3 is automatically controlled by the strain on the cloth so that the tension is kept uniform. A gearing and clutch device is placed between the two take-up rolls and the driving mechanism.

Referring to the drawings, Fig. 1 is a ver-

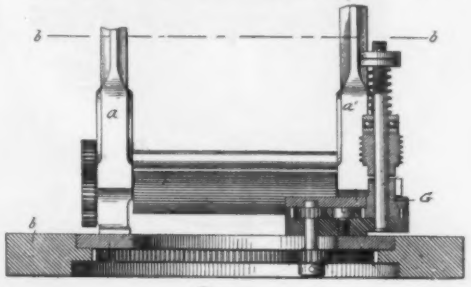


Fig 1

tical sectional elevation on the line a, a, of Figs. 2 and 3 through the lower portion of

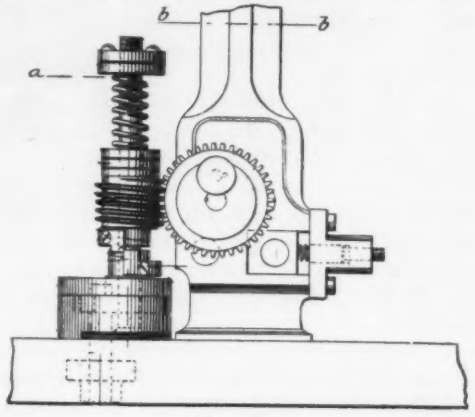


Fig. 2.

the take-up frame and adjacent parts. Fig. 2 is a side elevation of said parts as viewed in the direction of the arrow in Fig. 1. Fig.

3 is a sectional plan view looking downward on the line b, b, in Figs. 1 and 2, parts being broken away to better illustrate the internal construction. The take-up rolls are driven from a yielding member—the worm—which is held to its work by a spring, so as long as the resistance of the take-up rolls is not sufficient to overcome the spring the yielding member will continue to impart motion to the rolls. As soon, however, as the rolls are

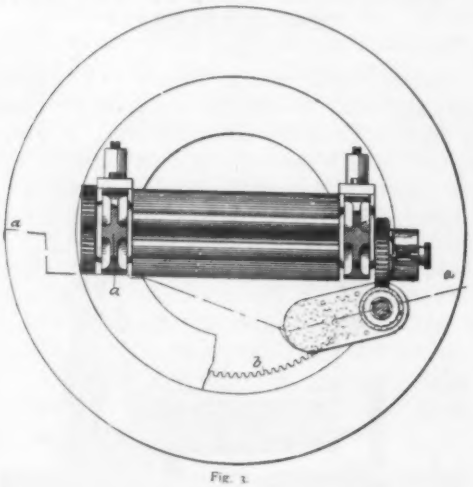


Fig. 1.

subjected to greater resistance and enough to overcome the spring, this resistance will react through the intermediate gearing on the driving-shaft and through the worm-wheel on the worm, causing the latter to move upward against the resisting influence of the spring.

In the operation of the machine, with the fabric coming from the needles uniformly and the take-up rolls drawing the same between them without undue tension, the driving-worm is held to its work with the vertical shoulder of its tooth in the path of the vertical shoulder of the tooth on the upper end of the sleeve, G, and receiving motion from the sleeve.

If there is an interruption in the production of the fabric by the needles and it is not produced fast enough for the take-up rolls to take care of, the rolls will be subjected to undue strain, and this reacting on the worm the latter will be forced endwise on its post against the pressure of the spring, which action will automatically disconnect the clutch, and the worm and parts driven thereby will come to a rest.

This inaction of the parts will continue so long as the strain on the rollers is great enough to overcome the spring; but as soon as the tension on the work, and consequently on the rollers, decreases, the spring will again come into action and will force the worm down again until the tooth on its lower end is in the path of the tooth on the sleeve, G, whereupon the latter will again operate the worm and the action of the take-up rolls will be resumed.

THE "NEW VICTOR" KNITTING MACHINE.

A new model of the well-known Victor hosiery knitting machine has been put on the market by the American Knitting Machine Co., 167 Oxford St., Philadelphia, Pa. It embodies all the meritorious features of the old Victor, and also improvements whose merits have been demonstrated by experience as desirable and important. Among the important features of the "New Victor" are the following:

The self-acting or automatic heel lever trip cam;

A very heavy yarn carrier, ring and base of cast iron, distributing the balance over the head;

New guard stitch and nose cams. These three cams engage the needles directly and insure a perfect passage of the needles over and under the cams in the head;

The new friction on the gear shaft, which prevents the cam head from being carried beyond the point at which it was intended to operate;

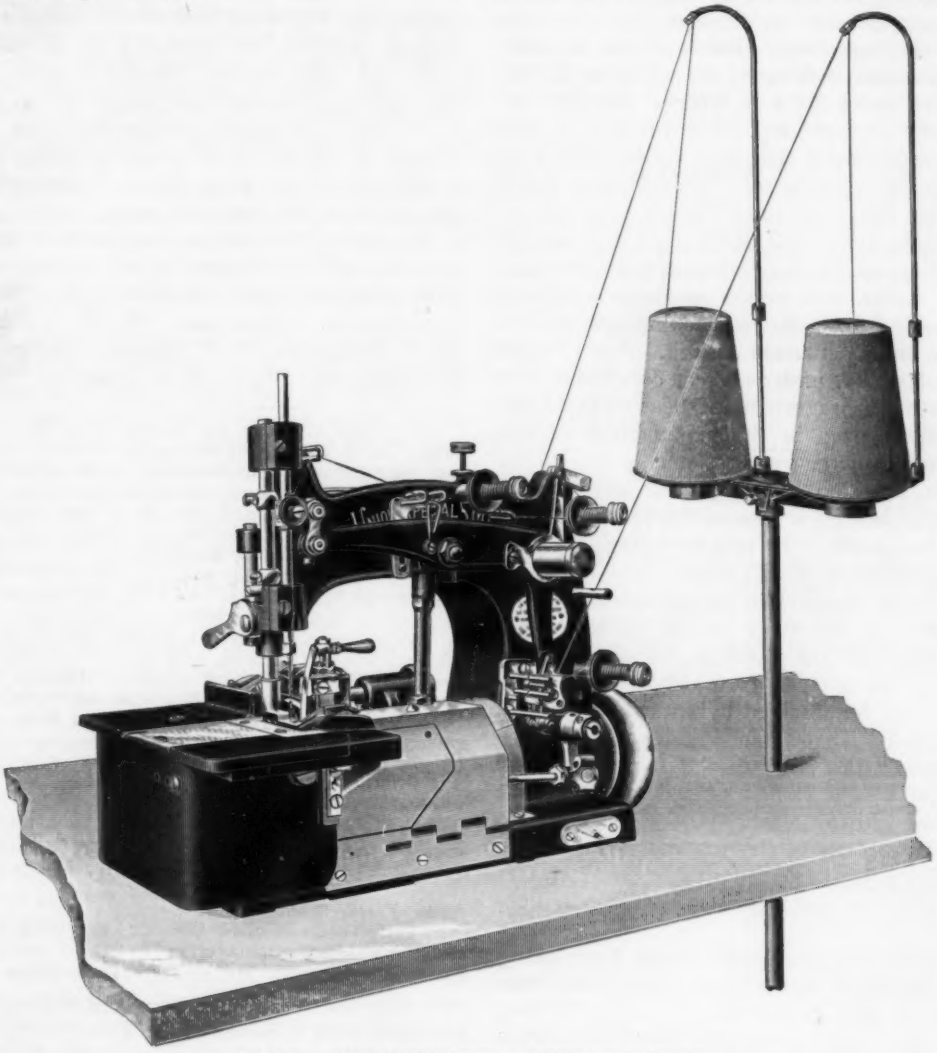
The new friction on the back shaft, dispensing with the steel friction band;

Shears on the reinforcer, and the use of malleable iron and steel in all the component parts on the machine for which cast iron was formerly used.

The old screw holding the outside sinker ring on the cylinder has been discarded and a clip that engages the lip of the cylinder substituted. The screw, therefore, does not touch the cylinder. Being engaged on the outside sinker ring it cannot jam the walls of the cylinder when the ring is tightened.

In addition to these improvements the different parts have been greatly strengthened.

The American Knitting Machine Co. have re-established their Southern agency at Hendersonville, N. C., where R. M. Oates, formerly with them, is again their exclusive Southern representative.



THE NEW UNION SPECIAL SINGLE INTERLOCK MACHINE.

NEW UNION SPECIAL SINGLE INTERLOCK MACHINE, CLASS 15400.

The accompanying cut illustrates a new machine recently brought out by the Union Special Machine Company. It is especially designed to be run at a very high speed with average mill help. This company has for many years given special attention to the wants of knit goods manufacturers, and their wide experience, coupled with the best mechanical ability, enables them to produce a machine which will meet the most exacting demands for rapid and perfect work.

Several radical improvements have been incorporated in its construction, which enables it to be operated at the exceptionally high speed. The stitch-forming mechanism is of the highest efficiency and performs its

work with a remarkable degree of accuracy. The working parts are all readily accessible for cleaning and oiling, as the cover is hinged at the base of the machine so that the entire mechanism can be quickly exposed to view.

It is provided with a trimming device, acting in advance of the sewing mechanism, to prepare the edge of the fabric for the covering stitches, which eliminates the necessity for accurate guiding of the work on the part of the operator, and insures absolute uniformity of stitching, thus producing more and better work than is possible without the trimming mechanism. The trimming device can be instantaneously thrown into and out of action at the will of the operator, and the machine used with or without it, as desired.

It makes in a single operation a covered seam, and positions the locking point of the stitch in any manner desired. For strength and elasticity, under correct conditions, it is claimed this seam cannot be surpassed and is largely used in the manufacture of knit underwear, jersey waists, etc.

For finishing cut edges on any and all kinds of fabrics, it produces a finish which is very desirable. It makes either the two thread or three thread stitch, the latter making a purl edge. The change from one style of stitch to the other can be made without difficulty, and the width of the stitch can be varied from 3/64 to 3/16 inch. A still wider width can be obtained by special adjustment if desired. There is no tendency to stretch or pucker the edge of the fabric, and the lightest weight ribbed knitted goods can be finished with an elasticity of stitch equal to the full stretch of the material. This style of edge finish is very desirable on all classes of knitted goods, blankets, bedspreads, hosiery, etc.

The machines are also fitted for making the concealed stitch hem having the raw edge covered on the inside, which is very extensively used in the manufacture of undershirts, golf skirts, sweaters, etc., due to the elasticity of the hem and other meritorious features.

A special style of machine, 15400 F, has been designed for welting the tops of seamless hosiery, as it has been found better results can be secured by the use of a specially fitted stocking machine, as compared with one fitted for a large variety of work. The constant aim of manufacturers of seamless hosiery is to produce a hem equal to that made on the full fashioned goods, and the hem made on this machine is supplying this long felt want. The builders claim it embodies the following desirable features to a degree never before produced by a sewing machine: An entirely concealed stitch on the outside, a finished hem on the inside, and an elasticity of stitch greater than the full stretch of the stocking, which prevents any possibility of the seam being broken when placed under the severest strain.

Samples of the work accomplished on these machines can be obtained at any of the company's offices located at Chicago, New York, Philadelphia, Amsterdam, N. Y., Cohoes, N. Y., Rochester, N. Y., Boston, Cincinnati, St. Louis, San Francisco or Montreal.

The Grauer Mfg. Co., 346 Walnut Lane, Germantown, Pa., is putting on the market a line of laces and edgings for knit underwear in both cotton and wool, which for beauty and attractive design are most commendable, and they have been meeting with much success in the way of orders.

Hosiery Printing.

The present styles show a decided call for fancy hosiery, and the services of a hosiery printer are frequently sought. J. Bray, corner of Hancock and Oxford Sts., Philadelphia, Pa., is an expert in this line. He makes a specialty of two-color work and gets up special designs and makes printing blocks for the trade. Anything in connection with hosiery printing is in his line, and inquiries will receive prompt and careful attention.

Oiling Knitting Machinery.

Editor Textile World Record:

Please give me detailed directions for oiling and cleaning knitting machinery.

Harper (444.)

Knitting machines require oiling and cleaning at least once a day, sometimes twice a day, and some parts of certain machines four times a day. In the case of latch needle machines on hosiery all the parts that require lubricating, except the needle cylinders, should be oiled every morning. The slots of the needle cylinder, instead of being oiled, should be greased with vaseline about twice a week. Take out the cylinder and with the finger put a little vaseline around the needle slots imme-

diately below the hubs of the needles. This will lubricate the needles as well as the needle slots and the vaseline will pass from the needles to the cams and lubricate them also. By using vaseline instead of oil for the needle cylinders the greasy needle marks so often found in knit goods will be avoided.

The majority of mill help use more oil than is necessary and put it in places where no oil is required. Oil cans should be provided with spouts from which it is possible to obtain but a small quantity at one time, and each operator should be carefully instructed what places to oil and what not to oil.

This class of machines should be cleaned every night before closing time by using part of a waste foot of a stocking drawn over the hand, and all the lint that has accumulated from the days' running wiped off; the lint between the sinkers should also be wiped off.

Spring needle circular machines, not being provided with oil cups at the bottom of the studs, should be oiled four times a day; once in the morning, again about ten o'clock, just before starting after the noon hour, and finally about three o'clock. These sinker or feed burrs revolve very fast and therefore require more oil than any of the other wheels. It is very important that these wheels should run smoothly and easily. If they are allowed to get dry they are likely to stick in the studs and the result will be a lot of broken needles. The inside wheels do not need oiling oftener than twice a week, as there is an oil cup attached to the end of the stud, into which oil can be poured in sufficient quantity to last three days. The cylinder stud and other geared studs should be oiled at the time of oiling the inside wheels as they are all oiled from the inside of the cylinder. Other parts underneath the table of the machine, such as the bearings of the drawing shafts, should be oiled about twice a week if not provided with oil cups. All the other outside wheels should be oiled four times a day.

The cleaning of the machines depends a great deal on the class of yarn being knitted. If the yarn is made of shoddy the lint will accumulate very fast, much faster than with ordinary cotton yarn. With cotton yarn it is sufficient to wipe off the lint twice a day. In addition to this a blower or fan made from a piece of shoe leather about 12 by 16 inches should be used by taking one end of the leather between the two hands and fanning the wheels when they are in motion. This should be done at least once an hour. Care should be taken not to allow too much lint to accumulate before it is blown off, otherwise the lint will be blown into the yarn guides of the feed burrs and cause a smash on the machine. If it has been neglected too long the machine should be stopped before blowing it off.

The best results are obtained from knitting machines when they are cleaned and oiled regularly. Some manufacturers do not think it pays to lose the time to stop the machines to do this, considering it so much lost production, but if the oiling, cleaning and blowing off is done regularly and systematically the machines will do better work and as much of it in the long run as if some parts were allowed to run until they get dry for want of oil, and the needles break from the accumulation of lint around the wheels. Full fashioned machines on hosiery and underwear should be oiled twice a day, at morning and at noon, and the working parts near the needles cleaned every day before stopping.

These directions refer to the principal working parts. For other parts, such as the tables, take-ups, and the framework of the machines, cleaning once a week is usually sufficient and is generally done on Saturdays. F. W. H.

Balbriggan Underwear.

Editor Textile World Record:

Enclosed we hand you three samples of cloth used in the manufacture of men's balbriggan underwear. No. 1 is the natural combed peeler yarn knit in the regular way which shows the shade of the yarn and the fabric. No. 2 is a peeler yarn which has apparently been run through an emulsion of some sort, and No. 3 is the same cloth which we think has been stained to the Egyptian shade. You will notice that these last two samples are comparatively free from curl and No. 1 sample curls very badly. Can you inform us what the emulsion is that is used on the stained fabric and where it could be procured, also can you advise us of the method of handling these goods so as to take out the curl and make them lie comparatively smooth? The yarn manufacturers do not appear to know much about this fabric and such information as you may have at hand might very materially aid us in getting the results desired.

Williams (453).

The three samples have been submitted to an expert and his report on them is as follows:

Sample No. 1 is made with two threads of combed peeler yarn.

Sample No. 2 is made with a single thread of combed peeler yarn.

The double thread in No. 1 is heavier than the single thread in No. 2. I do not think No. 2 has been stained at all, but the single thread of the yarn in No. 1 is much finer than that in No. 2; a better grade of cotton has been used and therefore the white of No. 1 is clearer than that of No. 2.

An emulsion may have been used when winding the yarn, but this emulsion should not in any way stain the cloth. A recipe for a solution or an emulsion for yarn was published in the April, 1904, issue, page 146.

Sample No. 3 is the same cloth as No. 2, which has been dyed or stained an Egyptian shade. The dyeing or staining of combed Peeler knitted cloth to match the color of the genuine combed Egyptian yarn or cloth has been done by a large number of manufacturers of Egyptian or balbriggan underwear for several years. An aniline dye is used which is now furnished by any of the dealers in dyestuffs. The cloth is dyed in the same manner as any other cloth is dyed. The Egyptian shade is a light tint or stain and only a small quantity of dye is necessary. To dye a black the cloth would have to be boiled from 1 1/2 to 2 hours; for the Egyptian shade only about 20 minutes' boiling is necessary.

The tendency of No. 3 to curl has been removed by the boiling of the goods. Nos. 1 and 2 have not been dyed; perhaps they have not even been wet up, but are just as taken from the machine after knitting; hence the curl. Some manufacturers when using combed peeler cloth in the white and also the genuine Egyptian yarn, take the cloth from the machine and thoroughly steam it before rolling. This takes out nearly all the curl. If it is desired to take out all the curl, the cloth that is not dyed or stained is first thoroughly wet in hot water, then dyed and rolled on the usual dryers. There will then be no curl when the cloth is cut.

Lafayette.

Recent Knitting Patents.

KNITTING MACHINE. 764,434. Samuel A. Dodge, Millbury, Mass., assignor to William M. Keepers, Newark, N. J.

KNITTING MACHINE. 765,043. James E. Rowe, Pawtucket, R. I., assignor to E. Jenckes Mfg. Co., Pawtucket, R. I.

KNITTING MACHINE. Circular Spring Needle. 763,825. Frank Wilcomb, Norristown, Pa.

KNITTING MACHINE NEEDLE and Jack. 763,400. Daniel Hurley, Bennington, Vt., and Chas. J. Sibbald, Troy, N. Y.

KNITTING MACHINES. Device for Engaging Transfer Quills and Needles of Circular. 765,385. Harry A. Houseman, Philadelphia, Pa., assignor to Standard Machine Co., Philadelphia, Pa.

KNITTING MACHINES. Lace Pattern Mechanism for Straight. 765,510. John E. Pike, Philadelphia, Pa., assignor of two-thirds to Thomas W. Buck and Herbert Pike, Philadelphia, Pa.

KNITTING MACHINE RIB. 764,607. Frank Lasher, Bennington, Vt., assignor of one-half to William H. Bradford, Bennington, Vt.

KNITTING MACHINE Stop Motion. 774,338. Alfred Blanchard and Frank H. Gates, Ware, Mass.

KNITTING MACHINE Take-Up Mechanism. 764,579. David K. Gormly, Troy, N. Y., assignor to Robert W. Gormly & Co., Troy, N. Y.

KNITTING MACHINE Thread Guide. 764,578. Robert W. Gormly, Troy, N. Y.

KNITTING MILL NEWS.

New Mills.

*Delaware, Wilmington. Operations will be started about Aug. 15th in the Delaware Hosiery Co.'s plant. They will make misses' and children's seamless rib and flat hosiery, operating 100 knitting machines. Company is capitalized at $15,000. Goods will be sold through Berry & Smith, of New York.

Illinois, Chicago. The Textile Manufacturing Company, manufacturers of knit goods, capital stock $17,000, has been incorporated. Levi Strauss, A. S. Leour and others are the incorporators.

Massachusetts, Chelsea. Harry Gordon, formerly connected with the Boston Knitting Mills of Cambridgeport, is starting the manufacture of sweaters in a small way on 67 Arlington St., this city, under the name of Harry Gordon Knitting Co.

*Michigan, Grand Rapids. The Imperial Knitting Company, recently incorporated with capital stock of $50,000, started operations July 1st. Plant is equipped with 24 knitting machines, for making the patented turnover children's stockings. Samuel B. Jenks is president of the company; P. B. Garvey, treasurer, and Geo. T. Fettig, superintendent. Use electricity.

New York, Amsterdam. The Chalmers Knitting Company has recently been incorporated with a capital stock of $25,000. They have leased a floor, with power, and it is reported are installing machinery for the manufacture of underwear.

New York, Cohoes. The Electric Knitting Co. is the name of a new concern which has leased a floor in the Parsons Mill on Remsen and Factory Sts., and will manufacture novelty underwear.

*New York, Dunkirk. A visit has been paid to this city by George A. Frisbie, of Utica, and other gentlemen associated with him in knitting mill enterprises in Utica and vicinity, for purpose of looking over the ground and considering the advantages of this place for a new knitting mill. It is understood that the citizens have subscribed about $15,000 toward the building. No decision has as yet been arrived at.

New York, Sammonsville. The Payne Knitting Mills have been incorporated with capital stock of $70,000 to operate mill at this place. H. L. Bailey and T. H. S. Cone, with the National Yarn Company, New York City, are interested.

New York, West Sand Lake. John R. McLaren is going into the knitting business again, and the McLaren Knitting Company has been incorporated with capital stock of $10,000. The directors are

John R. McLaren of West Sand Lake, John Trainor of New York, and John E. Glassborow of Troy.

*North Carolina, Monroe. H. E. Wilson, who has for three years been general superintendent of the Elizabeth City Hosiery Co., at Elizabeth City, is to be general manager of the new Crow Knitting Mill which has been previously reported. Ground for the new building was broken July 11. This is to be an up-to-date mill and, when fully equipped, production will be one thousand dozen per day of cotton hose. Mr. Wilson's success at the Elizabeth City Mills make the outlook for the new mill very bright. When Mr. Wilson took hold of the Elizabeth City mill it was not in the best condition, but the past two years has paid very satisfactory dividends besides decreasing its bonded indebtedness nearly one-half.

*Ontario, Stratford. The Avon Hosiery Company expects to have the new mill in operation by August. A new building, 72x38 feet, brick, will be erected for making ladies' hose, men's socks, toques and children's hose.

Pennsylvania, Bath. D. J. Odenwelder, of Odenwelder & Co., retires from that firm to start a plant of his own for the manufacture of men's and children's hosiery, beginning with a plant of about 100 machines, doing his own dyeing and finishing and buying yarns. J. T. Learch has bought Mr. Odenwelder's interest in the Bath knitting mills.

*Pennsylvania, Chambersburg. The Chambersburg Silk Mfg. Co., recently incorporated with capital stock of $50,000, expects to have its new mill finished August 1st, for the manufacture of broad silks, and have these goods on the market Sept 1st. W. Richard Thomas, Jr., is president; William T. Haulman, treasurer, and Fritz W. Thomas, superintendent. There will be 50 silk looms; steam power. Sell direct.

*Pennsylvania, Duncannon. The new hosiery mill which John G. Martin has been building, is completed and started up.

Pennsylvania, Jonestown. A new company has been formed by parties formerly interested in the Reading Hosiery Company, to operate a plant here. The Jonestown Shoe Company's building will be remodelled and machinery installed for maunfacturing hosiery and underwear. Thomas H. Capp represents the company.

*Pennsylvania, Philadelphia. Samuel Graham, of Bethlehem, is treasurer of the Philadelphia Hosiery Company recently reported incorporated. Charles F. Hendricks and Robert J. Harbison are also interested.

*Pennsylvania, Philadelphia. Thomas E. Brown & Sons are to build another large hosiery mill on Hazard St. Wm. Steele & Son, 16th and Arch Sts., are the architects and builders. It will be a brick structure, 5 stories, 160 by 56, with boiler house 80 by 32. The builders are now taking bids for the building.

Pennsylvania, Philadelphia. The Mascot Hosiery Company, Mascher and Turner Sts., who recently sold out their plant to the newly formed Narragansett Knitting Company, have changed their name to the Mascot Knitting Co. and will remove their business to 19 Strawberry St., where they will engage in the manufacture of hand knitted goods and buy and sell hosiery and half hose in the grey, having them dyed and finished before placing them on the market. The members of the firm are David Rosenbaum and Philip Saller.

Pennsylvania, Pottstown. The Endurance Knitting Mills have been incorporated with a capital stock of $10,000.

*Pennsylvania, Pottsville. The Auto Knitting Mills, recently incorporated, will manufacture hosiery and underwear from yarns 7's to 20's. Capital stock of $10,000. John H. Kaiser is president and treasurer and J. J. Saul, superintendent and buyer. There will be no dye house. Work has not yet been started on the new plant.

*Pennsylvaia, South Bethlehem. The Austin Knitting Mill have been incorporated with capital stock of $10,000. W. H. Jacobs, F. J. Groman and H. A. Groman are among the incorporators.

*Tennessee, Chattanooga. The new Davis Hosiery Mills start on their building July 2d and expect to begin production about December 1st. Will make men's, women's and children's hosiery. Capital stock, $20.000. G. H. Miller, president; W. B. Davis, treasurer and buyer. John M. Given, of Pittsburg and New York, will sell the goods. They will install 100 knitting machines, 5 sewing machines and dye their own product. Steam power. Very little of the equipment has as yet been arranged for.

Enlargements and Improvements.

Georgia, Penfield. The Penfield Hosiery Mills are putting in several Acme knitters in their mill.

Maryland, Hagerstown. The Blue Ridge Knitting Co. will increase its capacity by the addition of fifty Acme knitters built by the Mayo Knitting Machine & Needle Co.

Massachusetts, Lowell. The Lowell Hosiery Co. have purchased some Hemphill knitters for their plant.

New Hampshire, Franklin Falls. The Mayo Knitting Machine & Needle Co. have recently installed some of their Hemphill knitters in the mills of the Rome Hosiery Co., Rome, Ga., the Richmond Hosiery Mills, Rossville, Ga., and the Scott Stocking Mills, Bennington, Vt.

*New York, Elmira. The Elmira Knitting Mills advise us that they are only digging a small cellar for purpose of storing some loose cotton, and not building any addition, as was reported.

Massachusetts, Lowell. W. A. Eastman is to increase the capacity of his hosiery plant by the addition of Hemphill knitters.

New York, Philmont. The McNamee Mesh Underwear Co. has shut down for repairs and to install additional machinery before starting on next season's goods. The entire product of this mill is sold up one year ahead.

New York, Stittville. Hackett & Atwood Co., manufacturers of underwear, will build an addition in which they will install pickers and garnets. They will make other additions to the machinery.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.
We invite machine builders and others to send us such information for this department.

Table Friction Power Fan. The Metropolitan Sewing Machine Co., Nyack, N. Y., is putting on the market a special fan designed for factory use, and especially for sewing machine tables. During the early months of this year upwards of 100 factories have been fitted with these fans. They are noiseless in operation. No belts are required, as the fans are driven by friction connection with the main shaft under the table. They can be started or stopped instantly by turning an eccentric hand wheel on the top of the table. The comfort to operators resulting from their use is apparent, and brings a direct return in increased efficiency during the hot months. The price of the outfit is very reasonable.

Over-edging Machine. The Union Special Machine Co., 73 East Kinzie St., Chicago, Ill., and 47 Leonard St., New York, are bringing out a new over-edging machine, which they call No. 15,400, especially designed for over-edge seaming, hemming and finishing knit fabrics. High speed and durability are essential elements, and it is designed to run up to a speed of 4,000 stitches per minute, making a 2 and 3 thread stitch and a whip or pearl overstitch. It is illustrated in the Knitting Department.

Duster. William Schofield Co., Krams Ave., Manayunk, Philadelphia, Pa., are bringing out a new automatic stock duster for dusting and cleaning all kinds of raw stock, including wool and cotton waste of all kinds. The machine has a large production, and has been designed to accomplish this work efficiently and with little consumption of power.

Yarn Scouring Machine. The Philadelphia (Pa.) Drying Machine Co. are building a yarn scouring machine which is described in another part of this issue.

Bobbin Clutch for Spinning Frames. The Draper Co., Hopedale, Mass., are placing on the market a new clutch for their Rabbeth spindle, which is described in another part of this issue.

Intermediate Card Feed. William Schofield Co., Krams Ave., Manayunk, Philadelphia, Pa., have recently improved their well known intermediate feed for cards. It is claimed that this feed keeps the fibres parallel and that the woolen thread is thus made to resemble worsted.

Mercerizing Machine for Knit Goods. The Niederlahnsteiner Maschinenfabrik, Niederlahnstein, Germany, build a mercerizing machine for woven and knitted fabrics which is said to give excellent results. L. H. A. Schwartz, 113 Devonshire St., Boston, is the American agent. This machine is described in another part of this issue.

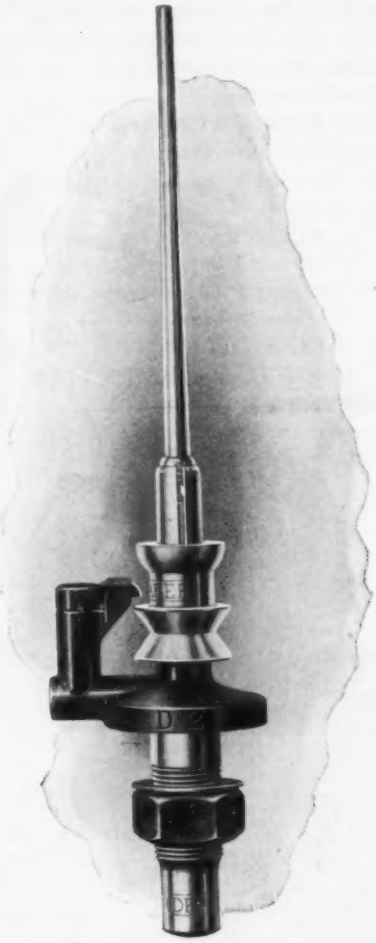
Knotter. J. W. Cooke & Co., Manchester, England, are supplying a bracket to hold the yarn knotter recently brought out by the same firm. When not in use the knotter is placed on the bracket attached to the machine which the operative is tending.

Warp Sizing Machine. Masurel Leclercq, Roubaix, France, has invented a method of sizing warp which is described in another part of this issue.

Air Humidifier. Paul Kestner, Lille, France, has recently offered to the textile trade in Europe his system of humidification, which, he claims, keeps the moisture in the atmosphere uniform and ventilates the work rooms so that it is possible to keep all windows and doors closed, even in hot weather. The Kestner system has been installed in several French mills.

THE NEW RABBETH BOBBIN CLUTCH.

A new method of driving spinning frame bobbins has been adopted by the Draper Company, Hopedale, Mass., after having been tested in the thorough manner which that company employs with all the appliances they offer for sale. They consider it



THE NEW RABBETH BOBBIN CLUTCH.

embodies the most promising principle introduced into spindle construction in the last dozen years. The new bobbin clutch, Fig. 1, is the invention of Francis J. Rabbeth, who has done so much to develop the modern high speed spindle. In order to understand the advantages of the new type it is well to consider the disadvantages of the old.

With the regular Draper spindle the bobbin is preferably driven by frictional contact of the whorl in the bobbin chamber, the cup merely preventing splitting, and the upper bearing being made free. The difficulty with this and all other friction drivers is inherent in the bobbins themselves, which being made of wood are liable to great changes, especially bobbins used for filling yarn that are liable to be dampened by excess of steam or other moisture. Bobbins that swell will not come down into place properly on the whorl, so that the yarn either runs down over the base, or the traverse must be set to accommodate the high bobbins, thereby losing in the total amount of yarn spun on the same. If the bobbins are loose, they will not run steadily and will lose twist, making weak yarn. It is almost unnecessary to point out the disadvantages of not getting the full amount of yarn on the bobbin. With warp yarn it means more frequent doffing, more work at the spooler and more knots in the warp. With filling yarn it means more frequent changing of the shuttles on the common loom, more bobbins to place in the hopper on a Northrop loom, and more defects in the cloth from changes of filling on both styles of loom, unless the Northrop should have the additional attachment of the feeler or mispick preventer.

With the Rabbeth centrifugal clutch, the bobbin fits loosely, and may be placed with less labor and annoyance than the bobbin which has to be jammed down into place. It should perceptibly reduce the time necessary for doffing. There will be no tendency to bend the spindle blade, causing crooks and even breaks when warped bobbins are used, which will fit better and drive better on the Rabbeth clutch than with the ordinary spindle. The loose pieces on the whorl are thrown out as far as they can go by the centrifugal effect of the spindle's rotation and ensure driving contact with the bobbin by this yielding pressure. In the preferred form, the diameter of the circle of the clutch is much less than that of the circle of our regular whorl at the same point, allowing the bobbin to be thicker and stronger at the base. This is especially advantageous for filling

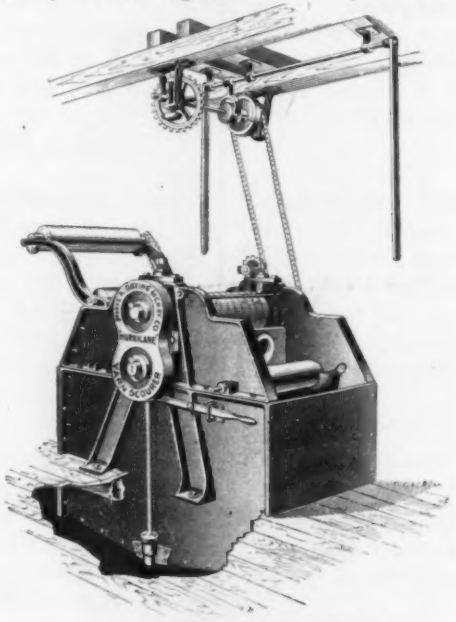
bobbins, as it gives greater leeway for reaming, when reaming is necessary. It is claimed that the use of the centrifugal clutch will not only allow all the bobbins on all the frames in a spinning room to be at exactly the same height, thereby gaining in length of traverse at least one-half an inch, but also lessens repairs or replacements of bobbins, for the bobbins used will be not only stronger, but subject to much less rough usage.

The new Rabbeth clutch is protected by many patents covering modifications of the principle, such as the use of rollers, springs and various loose parts. Spindles with these clutches can be obtained in frames made by any licensees of the Sawyer Spindle Co., and will be furnished both for new and old frames by the Draper Co. They are also prepared to sell blades with whorls equipped with this clutch for use with old bolsters and bases. There are many spindles that have nearly run their limit which would be made practically as good as new by the use of a new blade, and certainly as good as new with a new bolster and a new blade. Substitution in such cases is easily made as the base itself need not be taken from the frame nor its position changed. The new whorl with centrifugal clutch cannot be applied to old blades.

THE HURRICANE YARN SCOURING MACHINE.

Yarn must be clean before it can be dyed properly. This is the first principle in dyeing. The Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa., build a special scouring machine for this important process. It is called the Hurricane yarn scouring machine, and the builders report that they are installing it not only in the newer plants, but that the older methods of yarn scouring are being supplanted by this more modern and economical machine. The finer and cleaner yarns can be scoured in a few minutes, while the coarser grades, such as gray yarn, require a somewhat longer time to clean them thoroughly. The hanks of yarn are tied by means of tie-bands into an endless chain, passing from the scouring liquor upward and then between the squeeze rolls, after which they pass through the scouring liquor again. This operation is continued until the yarn has been sufficiently scoured. It is thus necessary to handle the yarn but once. Yarn scourers will appreciate the advantages of being able to allow the yarn to remain in the machine until thorough scouring is accomplished. It is usually found desirable, however, to employ a second and third bowl for purposes of rinsing the yarn, a set of three bowls making a most complete arrangement and satisfying the most exacting requirements.

These bowls are constructed of iron plates securely bolted together and they are usually divided by a central partition into practically two independent compartments. By this means the yarn can be scoured in one side of the bowl and rinsed in the other half, if desired, or both sides of the bowl can be used for scouring. By this double-bowl arrangement, two chains of yarn are handled at one time, but the builders also make single-bowl scouring machines, in which but one chain of yarn is scoured at one time, this construction giving just half the capacity.



THE HURRICANE YARN SCOURER

The usual custom is to cover the upper rolls with rubber rings, but the lower roll can also be covered, if desired. Means are pro-

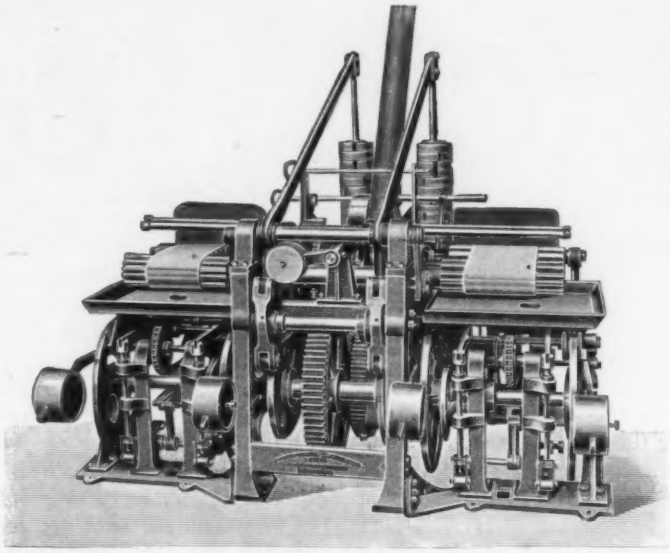
vided for changing the rubber rings about as they become worn, also for adjusting any wearing parts of the machine. The machine is driven by means of sprocket chains from a countershaft overhead, a clutch being provided so that the machine can be instantly started or stopped, lever handles being placed at both sides of the machine as an extra precaution and convenience.

In the subsequent handling of the yarn it is important that a system of drying shall be used that will accomplish uniform results in an economical and rapid manner. The Philadelphia Drying Machinery Company make a specialty of drying machinery, not only for skein yarn, but also for wool and cotton stock, cloth, warps and many other materials, and will be pleased to send further information or prices to any one interested in improving their scouring or drying facilities.

THE HAHN AUTOMATIC SKEIN YARN MERCERIZING MACHINE.

The skein yarn mercerizing machine shown in the accompanying illustration is built by the Niederlahnsteiner Machine Works in Germany and L. H. A. Schwartz, 186 Devonshire St., Boston, is the agent for the United States. This machine has proved very efficient and many of them are in use throughout Europe. At the beginning of the operation the corrugated and smooth rolls are at such a distance that skeins can be easily slipped on them. The corrugated roll is then gradually moved by the levers until the desired tension is obtained. The rolls are now started and the lye pans are brought under the yarn, which is then immersed in the alkali solution. The rubber squeeze rolls press against the smooth roll, ensuring thorough saturation, and after a certain time the lye pans are lowered and the water pans take their place to enable the yarn to be rinsed by alternate jets of warm and cold water coming from perforated pipes placed between the skeins. The rolls are now stopped and gradually moved toward each other until the skeins can be slipped off and replaced by a new lot. The machine, however, is in continuous operation, the stoppage of the rolls being only for a short time to enable the operator to change the skeins on both sides.

The liquor, which contains considerable alkali at the beginning of the rinsing operation, is automatically carried into a receptacle where it is stored for use in boiling, bleaching or for another mercerizing operation. The yarn is quickly and thoroughly impregnated and the movements of the machine are cor-



THE HAHN AUTOMATIC SKEIN YARN MERCERIRING MACHINE.

rectly timed to give the best results. The weighted levers exert a gradual and yet powerful pressure which is free from shock or jar.

The movements of the machine are automatic and the results, therefore, are not dependent upon the care and attention of the attendant. The uniformity of the work is due to the regularity and accurate action of the machine. The machine is strongly built to stand the great strain required for the mercerizing process. Many of the parts are of steel; the gearing is cut and there are no worm gears. The bearings of the smooth roll are keyed in the frame, while the bearings of the movable corrugated roll are adjustable like the cross head of a steam engine.

The builders of this machine guarantee a production of 450 pounds in 10 hours, but in actual practice a number of mills have turned out over 600 pounds in 10 hours. One man can tend two machines with a total product of from 1,000 to 1,200 pounds. The builders state that less than one pound of concentrated soda is required in this machine for three pounds of yarn, and are confident that the results in respect to the lustre and economy of labor and material are equal to those of any other process.

The Niederlahnsteiner works also build machines for mercerizing woven and knit goods. They guarantee uniform results without injury to the fabric or twisting of the pattern. This machine is built on the principle of the cloth tentering machine. The piece passes over a spiral spread roll into the lye basin, where it is carried through the entire length of the frame by the moving clutch chain. The clamps of this chain are of a specially patented construction and are designed to avoid injuring the goods. Only a small part of the clutch, which holds the goods, enters the lye. Among other advantages of this arrangement is a saving of lye. A part of the stretching takes place in the frame before the piece enters the basin, but the full tension does not occur until it has passed through three pairs of calenders. The chain holds the cloth for more than 40 feet.

The passing through the calenders is of importance, for here the goods are thoroughly impregnated. The cloth, after having passed the long lye basin, reaches another set of squeeze rolls in front of the vertical extension of the frame, and is then rinsed on the other side, first by warm and then by cold water. Notwithstanding the high production, which varies from 10,000 to 15,000 yards per 10 hours according to the fabric, there is ample time for thorough work. The machine can be adjusted for any required width of goods. The mercerizing of knit goods is an exceptionally difficult problem, but the builders claim that it is accomplished in a very satisfactory manner with the Hahn machine.

Further information can be had upon application to the American agent.

THE STURTEVANT TYPE OF ECONOMIZERS.

The two most essential qualities of a fuel economizer are its ability to utilize most efficiently for heating water a maximum amount of heat (otherwise wasted) from the escaping gases, and the accessibility of all surfaces for cleaning, repairing and renewals. The Sturtevant "Standard" and "Pony" type economizers were designed to make possible these two requisites. These economizers utilize practically all the waste heat from the gases by a patent system of staggered pipes. This system compels all the hot gases to encircle the pipes, increasing the effective heating surface to a maximum. The gases are thus broken up and forced to give up their heat to the surrounding surfaces.

A fuel economizer must be accessible both inside and outside if it is to be a valuable adjunct to a power plant. To make this possible the joints of the Sturtevant economizer are made taper metal to metal, and are so designed that any pipe can be taken out and duplicate substituted without disturbing any other pipe, section or side walls. This would not be possible if packing, cement or rusting were used to make tight joints.

Any header can be withdrawn and a duplicate substituted without disturbing any other header, section or side walls. Any section can be withdrawn and a duplicate replaced without disturbing any other section or side

walls. There are no connection pipes to remove and all water surfaces are rendered accessible by the simple removal of the caps.

The taper metal to metal joints make these economizers especially valuable for high pressures and are a marked improvement over gasket joints which spring and leak under such pressures.

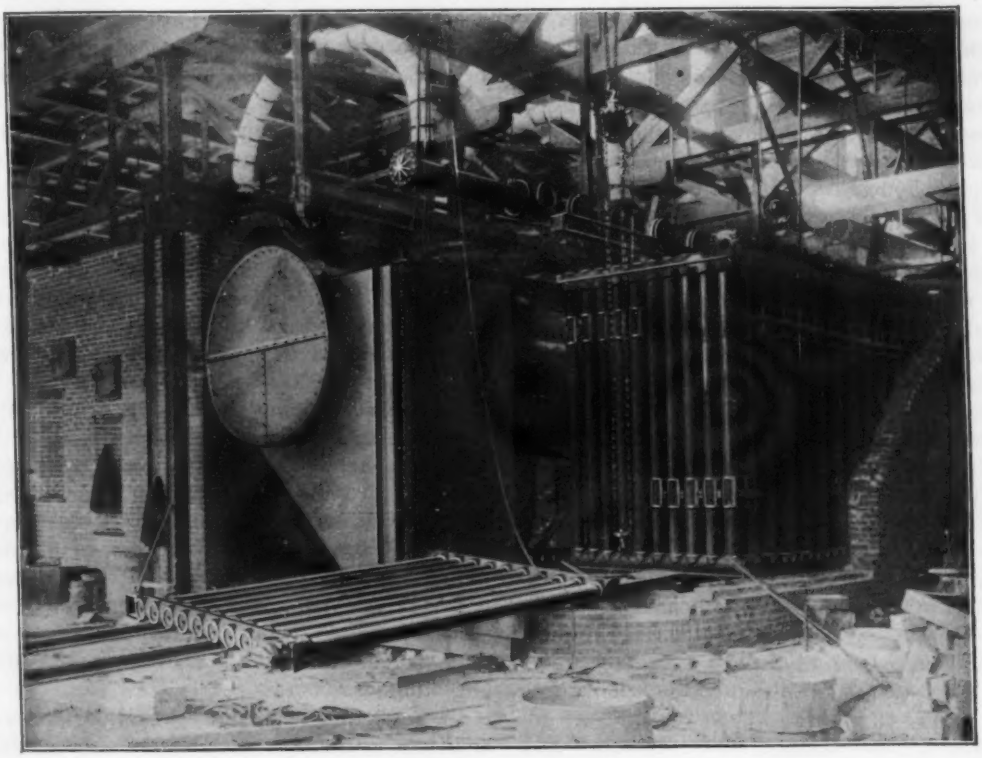
The scrapers are interchangeable and the driving mechanism positive in action. A guide plate for the scrapers is used to insure the scrapers position and prevents them from sticking and breaking. The driving pulley can be belted up parallel or perpendicular to the length of the economizer.

The Sturtevant economizers are not designed for forced circulation, but the connections are made in such a way that the flow of water is started in the right direction and tends to keep the flow up and down the consecutive sections without making undue work for the pump.

The foundations required for those economizers are comparatively simple. This is due to the fact that the machines are so constructed that the parts themselves possess the rigidity that would otherwise be required in the foundations. The fact that taper metal to metal joints are used also eliminates the necessity of building more rigid foundations, as there are no gaskets to loosen and leak if the foundations spring slightly.

Two general types of economizers are made by the B. F. Sturtevant Company, the "Standard" and "Pony." The "Standard" is built in sections containing pipes from four to twelve wide, the staggered system of pipes making it possible to build sections of an odd as well as an even number of pipes. The "Standard Economizer" is adaptable to power plants of almost any size, but is more commonly used for boiler capacities of 350 horse power and over.

The "Pony" type, as its name implies, is smaller than the "Standard" and is more adaptable to power plants of three hundred and fifty horse power or less.



THE STURTEVANT "STANDARD" ECONOMIZER.

Dyeing, Bleaching, Printing, Etc.

TEXTILE BLEACHING.

Without doubt, over ninety per cent. of all classes of bleached goods have been whitened by one of three standard processes, depending upon the nature of the material. These three processes are based on the use of sulphur, chlorine, or the peroxides. Woolen goods as a general rule are bleached with sulphur in one of its several available forms, that is, either as sulphurous acid gas obtained from the burning of sulphur in a closed chamber (sulphur house), or by the use of one of the chemicals that gives off the sulphur fumes in a bath, when acid is added.

The sulphur house process has a number of advantages and also some disadvantages which are so well known that they need not be referred to here. The one advantage of this form of bleaching is its relative cheapness, and also for the large quantity of material, chiefly yarn or blankets, that can be treated at one time.

Sulphur bleached goods, however, do not always remain as white as when first finished; they gradually become yellow, and with some grades of wool, this yellowing is somewhat rapid. This defect is due to the action of the sulphurous acid upon certain substances contained in the wool fibre which is gradually oxidized upon continued exposure to the air, and changes back to a colored substance, giving the wool its original unbleached color.

Carpet yarns are ordinarily bleached by means of the sulphur house method, and good results are always assured, because, when such yarn is afterwards dyed and finally washed and dried, their latent coloring matter is to a great extent removed, so that, even should a trace remain, it would not modify the shades afterwards obtained.

In dyeing sulphur bleached yarn, the skeins should be washed before entering the dye bath, as it has been often observed that otherwise uneven shades result, due to the presence of some free sulphurous acid, which is violently antagonistic to many coal-tar colors, and, while not actually destroying them, changes their shade seriously.

Bleaching of woolens with sulphurous liquors is a very different proposition from a manufacturer's point of view. It has a number of advantages, but its installation is rather costly, requiring a separate bleach shed, if bleaching is to be done on a large scale, and vats in sufficient number to handle all the stock, while the water supply should be not only ample, but clean and free from either dissolved iron salts or sediment.

For small bleaching operations, any ordinary tub or vat will answer, but when large quantities are to be done, special tanks must be constructed, circular or long, according to the space available.

Bisulphite of soda is the chemical principally used for liquid bleaching, and always gives superior results, as its mode of application is such that the process is always under observation and control.

The best bleaching process for wool in all stages of manufacture is the peroxide. By it the bleacher has a perfectly clean bath from beginning to end of operation, a solution that is odorless, and non-injurious to either fabrics or the hands of the workmen. Two peroxides are commercially practical, one, peroxide of hydrogen, and the other, peroxide of sodium, which latter yields peroxide of hydrogen when the bath is prepared for bleaching.

Peroxide of hydrogen is a liquid like water, and has a similar composition, containing twice as much oxygen as the latter; during the process of bleaching, half of this oxygen is set free, and does the work.

Sodium peroxide, however, must be decomposed with sulphuric acid in exactly the right amount, yielding hydrogen peroxide and sulphate of sodium; it is the former that is decomposed during the bleaching.

Bleaching with the peroxides is a very clean operation. The woolen yarn to be bleached is scoured and washed free from all soaps and alkalies, and while still wet, is im-

mersed in a bath containing the peroxide of hydrogen, previously neutralized with some silicate of soda, and afterwards made alkaline with the addition of either a further quantity of silicate or with ammonia.

If the bath has been correctly proportioned, the moment the yarn is immersed immense quantities of minute bubbles appear on the fibres, and in a few moments some larger ones are seen to rise through the bath, which is then known to be in a good condition.

As ordinarily prepared, bleaching should be finished in from 5 to 6 hours, when all that is necessary to do is to lift the yarn, allow it to drain into the bleach tank, strengthen with a further quantity of fresh peroxide, neutralize as in the first instance, and proceed with the next batch.

Bleaching with the peroxides requires entire absence of metals of any kind in contact with the bleaching solution, as it weakens it. Also, to obtain the best results, clean and pure water should be used, in fact, no other will do.

Bleaching wool with chlorine is not practical. Several processes have been devised, and a few patented, but up to the present, no wool is so bleached. On the other hand, chlorine, as obtained from bleaching powder is the only practical bleaching agent for cotton, and while the process is one of great simplicity, yet it requires observance of one simple point, and that is to wash well after bleaching to remove the soluble chlorine compounds, and thereby preserve the strength of the threads.

To attempt cotton bleaching without the use of ample wash waters is dangerous.

Electric bleaching, that is, the use of a solution of chlorine in one of its active forms, obtained by electrolizing a solution of a soluble alkaline or alkaline earth chloride, is not at the moment, practical, and it is a significant fact that no such process is exhibited at the St. Louis Fair. Electric bleaching is possible, indeed, it is being used daily, not only in this country, but in Europe, but only for wool pulp, while for the treatment of textiles it is yet in its experimental stages.

The cylinder printing press was first used by Bell in 1785.

ARTIFICIAL SILK.

This product bears such a deceptive resemblance to pure, natural silk, that for many articles of textile manufacture, such as neck-wear material, fringes, etc., it has already found a very wide field of usefulness, and it is quite certain that this field will continually widen, so that we may expect to find the output of a mechanical spinner taking the place of the material spinner, with the result that the artificial article will take the place of the real.

Artificial silk is noted for its pronounced lustre, which is very much in its favor, rivaling in some instances some grades of natural silk; but on the other hand it is deficient in strength, even to such an extent as to entirely prevent it being used in many classes of fabrics where it would otherwise be admirably adapted.

While many tests and experiments have been made during the past two decades looking to the production of such a fibre, it remained for a French chemist, the Count H. de Chardonnet, to produce, among all the various kinds and types of artificial silk, the one that is most commonly referred to under this name. This particular silk is made from strongly nitrated cotton or other form of cellulose; even fine wood shavings are employed for the purpose. The nitrocellulose is made by treating the cellulose with a mixture of strong nitric and sulphuric acids, and then washed well to remove the last traces of acids. This product is then dissolved in a mixture of alcohol and ether so as to yield collodion, which is then filtered, and is then ready to be made into the silk.

The collodion—which is somewhat thick or viscous—is forced by means of a pressure ranging as high as 150 pounds per square inch, through fine glass tubes, the orifice of which is extremely small, the resulting thin stream being allowed to pass through cold water, which instantly hardens the fine filament, which is essentially the end of the operation. The spinning consists of winding three or more of these filaments on a reel, giving it a slight twist so as to form a thread or "filature," when it is further wound into hanks for packing and shipping.

It has been possible to make use of certain dyes in the alcohol-ether solution, the result being the production of "dyed" filaments, but aside from the novelty of this operation, it is hardly practical.

The artificial silk as produced by this process is quite inflammable, but it is readily denitrated by the use of certain chemicals so that it is free from such an objection. All artificial silk made from nitro cellulose has been so treated.

Regarding the several kinds of artificial silks now met with, little need be written here, but it may be advisable to give a few of the important characteristics and tests that can be used in identifying them. All artificial silks swell to some extent when soaked in water, but do not dissolve. If they are replaced in alcohol or glycerine, they contract to their original size without any other change. If a sample of collodion silk is immersed in strong sulphuric acid, it swells rapidly and then dissolves; cellulose silk gradually becomes thinner and then dissolves, while gelatine silk will dissolve only upon heating.

Concentrated cold hydrochloric acid has only a very slight action, but on heating, gelatine silk will rapidly dissolve. Acetic acid causes only a swelling of the collodion silks, while gelatine silk dissolves, and quite rapidly, on heating.

All artificial silks will dissolve rapidly if immersed in a moderately strong solution of chromic acid. This test, in the absence of others, serves to distinguish this class of silks from real silk, which dissolves very slowly. In the presence of a sulphuric acid solution of diphenylamine, all cellulose silks give a blue coloration—the characteristic reaction of the nitro-compounds. In a 30 to 40 per cent. solution of caustic potash, gelatine silk dissolves, while the collodion silks simply swell up, not even dissolving upon heating. The alkaline liquid is colored yellow while the natural white silks dissolve without any color being imparted.

The well known ammoniacal copper solution dissolves collodion silks with previous swelling, while the gelatine silk is insoluble, but imparts a violet coloration to the solution.

An alkaline copper glycerine solution dissolves natural silk at 170 deg. F., while gelatine silk dissolves only after one minute or so; this test applies also to tussah silk. The other silks are not acted on by this reagent.

Iodine in iodide of potassium colors artificial silk red or reddish-brown, which is gradually removed upon washing. Iodine in sulphuric acid stains natural silk yellow; gelatine silk, yellowish-brown and collodion silk a deep violet blue. Chlor-iodide of zinc stains collodion silk blue-violet, while gelatine silk and natural silk is stained yellow and gradually goes to pieces.

On burning gelatine silk the peculiar odor of burning hair or horn is noticed, closely resembling the odor of burning natural silk, while the collodion or cellulose silks when burned emit an odor not unlike that of burning paper.

One of the very greatest advantages of any kind of artificial silk over natural silk is the entire absence of any natural gums or "silk glue," so that the boiling-off process is entirely done away with. And well may it be, because this product will not stand the same treatment in a boiling soap bath that the real silks do. The natural quantity of moisture contained in artificial silk is 16 per cent. as against 11 per cent. in real silks.

Artificial silks are not difficult to dye, but it should be remembered that only certain classes of dyes are available—the basic—and also that prolonged immersion in water causes the fibres to become weak, even to such an extent as to break with provoking frequency. In dyeing, free, strong alkalies are detrimental to the fibres, but dilute acids are not. Soaps are not necessarily injurious, but when used, the time of immersion should be as short as possible.

The following suggestions will be found of considerable use in dyeing artificial silk. The only precautions to observe are to feed the color into the dye bath in two or more portions, work the silk carefully, turning it on the sticks only being necessary, and to keep the temperature down as low as possible, say not higher than 120 deg. F.

Reds may be dyed with Fuchsine or Safranine.

Pinks, with very light percentages of the

above, while for very clear pinks, Rhodamines or Eosines are recommended.

Scarlet, combinations of Safranine and Phosphine, or with a yellow shade of Chrysoidine.

Browns, use the Bismarck Browns and Chrysoidines, which may be shaded with Fuchsine or Methylene Blues.

Violets, use all the shades of Methyl Violets.

Navy Blues, Methylene Blue shaded with Methyl Violets.

Light Blues, Methylene Blue.

Greens, use Methylene Blue as a base and shade with Thioflavine T or Auramine for bright colors, while for olive tones, shade with Bismarck Brown.

Yellows, for all shades of yellow use Thioflavine T.

Gold, the best gold shade is only to be obtained by using Chrysophenine, and dyeing at a slightly higher temperature with a small proportion of common salt in the bath.

Artificial silk is never bleached on account of certain practical difficulties; it may, however, be "dyed white" by immersing for 6 to 10 hours in a dilute bath of phosphate of soda, lift, rinse, and in a fresh bath, tint with a very small quantity of any blue shade of methyl violet. Very satisfactory results are to be obtained in this manner.

Rotary Cloth Press. Wm. Whitely & Sons, Ltd., Lockwood, England, have recently improved their rotary cloth press. It is equipped with an air distributing box for cooling the cloth after pressing and before folding. The air is supplied by a fan. This device is designed to prevent irregular cooling when the goods are folded and to restore the natural moisture which has been evaporated from the cloth by the heat of the press rolls.

Loom for Damask Weaving. Herman Staubli, Horgen, Switzerland, has recently brought out an improved method of weaving damask. Jacquard heddles with lingoes are used in place of the back harnesses. When the front harness lifts a thread that has been lowered by the back heddles the latter are raised also and thus the objectionable crossing of threads is avoided.

Centrifugal Dyeing Machine. Franz Koenitzer, Zittau, Germany, has recently brought out a centrifugal dyeing machine for dyeing textile materials which is said to create a vacuum in the material and thus facilitate the saturation with the dye liquor.

Raw Stock Dyeing Machine. Colell & Beutner, Neukirchen, Germany, recently placed on the market a machine for dyeing raw stock which is operated by the well-known circulating system, the circulation being maintained by a rotary pump.

New Color Cards.

Alizadine Yellow and Brown; Read, Holliday & Sons, New York City.

This card shows twenty-four samples of woolen yarn dyed different shades with the Alizadine Yellows and Browns. It also has a table giving the percentages converted to English weights.

Pyrol Black and Blue; C. Bischoff & Co., 88 Park Place, New York City.

A pamphlet giving full directions for dyeing loose cotton and cotton yarn and piece goods with Pyrol Black X and R O, and Pyrol Blue Black and Blue Black 2B.

Domingo Chrome Green W; C. Bischoff & Co., 88 Park Place, New York City.

A card showing 3 per cent. dyeings of Domingo Chrome Green W on raw wool, woolen yarn and piece goods.

Diamine Fast Black F; Cassella Color Co., 182 Front St., New York City.

One sample of cotton yarn and two of cotton piece goods dyed with different percentages of Diamine Fast Black F.

Azo Acid Blue; H. A. Metz & Co., 122 Hudson St., New York City.

One sample of worsted yarn and three of worsted piece goods dyed with 1 1/2 per cent. of Azo Acid Blue 3 B Conc. Two of the samples have white cotton effect threads which are not stained with the dye.

Acid Alizarine Yellow R C; H. A. Metz & Co., 122 Hudson St., New York City.

Two samples of raw wool, one of slubbing and one of woolen yarn dyed different shades with Acid Alizarine Yellow R C.

Tetrazo Sulphur Brown; American Dyewood Co., 156 William St., New York City.

A case containing eighteen samples of raw cotton showing different shades of the Tetrazo Sulphur Browns.

Metachrome Colors; Berlin Aniline Works, 213 Water St., New York City.

Thirty-six samples of loose wool dyed with the Metachrome Colors for which full instructions are given.

Guinea Fast Green B; Berlin Aniline Works, 213 Water St., New York City.

Three samples of woolen yarn and two of woolen piece goods dyed with different percentages of Guinea Fast Green B.

Oxy Diaminogene E M; Cassella Color Co., 182 Front St., New York City.

Two samples of mercerized cotton linings dyed black with 4 1/2 per cent. of Oxy Diaminogene E M.

Immedial Blue and Black; Cassella Color Co., 182 Front St., New York City.

Six samples of waistcoat and shirt materials in which the colored threads are dyed with different percentages of Immedial Blue and Black.

Black Dyeings; Cassella Color Co., 182 Front St., New York City.

Six samples of cotton piece goods dyed with the Oxy Diaminogene colors and discharged with Hyraldite W.

Anthracene Chrome Blue; Cassella Color Co., 182 Front St., New York City.

A card showing twenty-four samples of loose wool, slubbing, woolen yarn and piece goods dyed with Anthracene Chrome Blue G and BB.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation Subscription price for the Dyers' Supplement $1.00 per year

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Recipe No. 113.

Blue on Woolen Piece Goods.

Fast Acid Blue 2 on 100 lbs. woolen cloth. Prepare the dye bath with

2 lbs. Fast Acid Blue 2.
(Sykes & Street, 85 Water St., New York.)
3 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter at 160° F., bring to a boil, and dye at a boiling temperature for one hour.

Fast Acid Blue 2 also exhausts when dyed with 5 to 10 lbs. of acetic acid, and dyes likewise on a chrome mordant. This blue can be used in combination with colors dyeing with either of the above methods, and is especially desirable for toning chrome or alizarine blues.

Recipe No. 114.

Yellow on Worsted Yarn.

Crystal Fustic Extract on 100 lbs. worsted yarn. First mordant the yarn in a bath made up with

3 lbs. Potassium Bichromate.
2½ lbs. Tartar.

Enter at 150° F., bring to a boil and boil one and one-half hours. The mordanted yarn is then dyed in a bath made up with

5 lbs. Crystal Fustic Extract.
(Sykes & Street, 85 Water St., New York.)
1 lb. Acetic Acid.

Enter at 120° F., bring slowly to a boil, and dye at a boil for one to one and one-half hours.

Crystal Fustic Extract is a new product and worthy of attention. It is not a solid extract ground up, but a true crystal from fustic extract. It is perfectly soluble even in cold water, is free from impurities and possesses high coloring power. Its clearness of shade will be noted from sample.

Recipe No. 115.

Brown on Woolen Yarn.

Alizadine Brown R on 100 lbs. woolen yarn. Prepare the dye bath with

2 lbs. Alizadine Brown R, previously dissolved in boiling water.
(Read, Holliday & Sons, Ltd., 7 Platt St., New York.)
10 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Enter the wool cold, raise to a boil in three-quarters to one hour, boil one-half hour and if the bath is not exhausted add up to 1 lb. sulphuric acid and boil one-quarter hour longer. When the bath is exhausted add ½ to 1½ lbs. Bichrome and boil one-half hour longer.

Recipe No. 116.

Light Blue on Worsted Yarn.

Alizarine Blue A S on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Alizarine Blue A S.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
10 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.

Enter yarn at 120° F., bring to a boil, and dye at a boil for one hour.

Alizarine Blue A S is an extremely level dyeing color, possessing excellent fastness to light, acids, and alkalies, and does not alter in artificial light.

Recipe No. 117.

Black on Worsted Yarn.

Anthracene Chrome Black P Extra on 100 lbs. worsted yarn. Prepare the dye bath with

7 lbs. Anthracene Chrome Black P Extra.
(Cassella Color Co., 182 Front St., New York.)
5 lbs. Acetic Acid.

Enter yarn at 140° F., raise to the boil, and dye at the boil, exhausting the dye bath in about ¾ of an hour by adding

10 lbs. Sodium Bisulphate.
or
4 lbs. Sulphuric Acid.

When dye bath is exhausted add 3 lbs. Potassium Bichromate, and after chrome for forty minutes at a boil.

Anthracene Chrome Black P Extra gives an excellent shade of black, possessing excellent qualities of fastness.

Recipe No. 118.

Tan Color on Cotton Yarn.

Tetrazo Sulphur Brown 3 G on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Tetrazo Sulphur Brown 3 G.
(American Dyewood Co., 156 William St., New York.)
10 lbs. Sodium Sulphide.
1½ lbs. Soda Ash.
50 lbs. Common Salt.

Boil the dye bath well, to insure complete solution of the color, then enter yarn at a boil, and dye at a boil for one hour. Rinse quickly in cold water and then wash thoroughly.

The above amounts are given for the first bath. It is advisable to keep a standing bath, in which case only about ⅔ of the quantity of dyestuff and sulphide is necessary, and the addition of enough salt to keep the bath up to its original specific gravity.

Tetrazo Sulphur Brown 3 G gives light tan shade of excellent tone and fastness.

Recipe No. 119.

Blue on Worsted Yarn.

Glaucol R on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Glaucol R.
(C. Bischoff & Co., 88 Park Pl., New York.)
4 lbs. Sulphuric Acid.
15 lbs. Glauber's Salt.

Enter yarn at 180° F., bring to a boil and dye at a boil for one hour, exhausting the dye bath.

Glaucol R gives an excellent blue, which is quite fast to light and milling. It dyes evenly and may be fed on at a boiling temperature.

Recipe No. 120.

Reddish Brown on Cotton Yarn.

Tetrazo Sulphur Brown 3 R on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Tetrazo Sulphur Brown 3 R.
(American Dyewood Co., 156 William St., New York.)
10 lbs. Sodium Sulphide.
1½ lbs. Soda Ash.
50 lbs. Common Salt.

Boil the dye bath well, to insure complete solution of the color, then enter the yarn at a boil and dye at a boil for one hour. Rinse quickly in cold water and then wash thoroughly.

The above amounts are given for the first bath. It is advisable to keep a standing bath, in which case only about ⅔ of the quantity of color and sulphide is necessary, and the addition of enough salt to keep the bath up to its original specific gravity.

Tetrazo Sulphur Brown 3 R gives a reddish brown shade of excellent tone and fastness.

Recipe No. 121.

Tan Color on Cotton Yarn.

Light Tan B 705 on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Light Tan B 705.
(Berlin Aniline Works, 213-215 Water St., New York.)
20 lbs. Common Salt.

Enter the material cold without any salt, bring to the boil and boil 15 minutes, before adding the salt. The boiling is then continued for 20 to 30 minutes, when the dyeing is completed.

Light Tan B 705 gives a beautiful, clear shade of tan and is of great value in the dyeing of hosiery, as the dyeings possess excellent fastness, and the dyestuff goes on very evenly.

Recipe No. 122.

Blue on Worsted Yarn.

Alizarine Blue B G on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Alizarine Blue B G.
(Thomas Leyland & Co., 53 India St., Boston.)
10 lbs. Glauber's Salt.

Enter at 120° F. and dye for one hour just below the boil, taking great care that the bath is heated gradually. If necessary clear the bath towards the end of the dyeing by adding

3 lbs. Acetic Acid.

Alizarine Blue B G is fast to light and milling and will be found very useful for the production of bright and full navy blues on all classes of woolen material.

Recipe No. 123.

Black on Cotton Yarn.

Katigen Black T G Extra on 100 lbs. cotton yarn. Prepare the dye bath with

16 lbs. Katigen Black T G Extra.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
30 lbs. Sodium Sulphide.
8 lbs. Soda Ash.
60 lbs. Glauber's Salt.

Dissolve the color separately with the sodium sulphide, then add to the dye bath, boil up, turn off heat and dye just below boil for one hour, keeping the material as well beneath the surface as possible, rinse immediately, and then after treat at 160° F. for one-half hour in a bath made up with

3 lbs. Potassium Bichromate.
3 lbs. Copper Sulphate.
5 lbs. Acetic Acid.

Katigen Black T G Extra will be found to give excellent and fast shades of black.

Recipe No. 124.

Blue on Cotton Yarn.

Paranol Blue B on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Paranol Blue B.
(E. M. Thayer & Co., 106-112 Broad St., Boston.)
20 lbs. Common Salt.

Enter yarn at 170° F., bring to a boil and dye at a boil for one hour.

Paranol Blue B is a very level dyeing color and may be dyed on wool and silk as well as on cotton.

Recipe No. 125.

Blue on Worsted Yarn.

Metamido Blue B on 100 lbs. worsted yarn. Prepare the dye bath with

1 lb. Metamido Blue B.
(E. M. Thayer & Co., 106-112 Broad St., Boston.)
2½ lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter yarn at 160° F., bring to a boil and dye at a boiling point for one hour.

Metamido Blue B produces a very brilliant blue, which is quite fast to light and milling, and does not redden under artificial light. It is particularly useful for brightening alizarine shades as it dyes evenly and may be fed on at the boil.

Recipe No. 126.

Crimson on Worsted Yarn.

Wool Crimson on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Wool Crimson.
(Thomas Leyland & Co., 53 India St., Boston.)
10 lbs. Glauber's Salt.
2 lbs. Sulphuric Acid.

Enter the yarn at 100° F., bring slowly to a boil and dye at a boil for one hour.

Wool Crimson is a concentrated level dyeing color of great intensity which is specially fast to light.

Recipe No. 127.

Blue on Worsted Yarn.

Azo Acid Blue 3 B Conc. on 100 lbs. worsted yarn. Prepare the dye bath with

1½ lbs. Azo Acid Blue 3 B Conc.
(H. A. Metz & Co., 122 Hudson St., New York.)
20 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.

Enter at 120° F., bring slowly to the boil and dye at a boiling temperature for one hour.

Azo Acid Blue 3 B Conc. possesses great coloring power and is suitable for the dyeing of all kinds of woolen goods in an acid bath, where fastness to rubbing, washing and water is desired. Its fastness to light is also excellent and this renders it valuable in the dyeing of ladies' dress goods.

Recipe No. 128.

Yellow on Worsted Yarn.

Acid Alizarine Yellow R C on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Acid Alizarine Yellow R C.
(H. A. Metz & Co., 122 Hudson St., New York.)
10 lbs. Glauber's Salt.
3 lbs. Acetic Acid.

Enter yarn at a temperature of 120° F., bring slowly to a boil, and boil ½ hour and then add

4 lbs. CH_3COOH

and continue boiling until the bath is exhausted. Then add

2 lbs. Potassium Bichromate

and boil ¾ of an hour longer.

Acid Alizarine Yellow R C possesses good fastness and can be dyed as a straight acid color or is rendered faster by after chroming. It may also be applied on a chrome bottom in combination with alizarine and other mordant colors. Its fastness to milling is excellent.

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*North Carolina, Tryon. The new building reported to be built here will be an addition to the Tryon Hosiery Company's plant.

Mill News.

COTTON.

New Mills.

*Alabama, Jacksonville. Contract has been let for the building of the Ide Cotton Mills for $36,000.

*Georgia, Athens. Dozier & Co., reported to begin the manufacture of mosquito netting, will start on a small scale, and are now in the market for looms and other machinery suitable for the manufacture of mosquito netting and similar fabrics. The buildings are ready and they will use electric power. They will buy their yarn from neighboring mills.

*Georgia, Eastman. It is reported that the Eastman Cotton Mills Co., which erected a building a number of years ago, may equip it with machinery to the extent of 3,000 spindles and about 100 looms. F. A. Cummock will have charge.

*Maryland, Baltimore. Work on the new cotton mills, which are being built by James Hooper at West Woodberry, are progressing rapidly. It is expected to have them in operation by January 1st, 1905, and possibly sooner.

*Massachusetts, Belchertown. The American Woven Belt Company, the new concern reported interested in plant here, expects to install the machinery soon.

Mississippi, Columbus. A company is being formed to manufacture yarns to be used by the Kavanaugh Knitting Co., now under construction at this place. The stock of the company is taken largely by local capitalists. The Secretary of the Progressive Union has the matter in charge.

*Mississippi, Columbus. The Columbus Yarn & Cordage Co. has been incorporated with and work started on erection of new plant. The main building will be 100 by 44 feet, with engine room 24 by 28 feet, and picker house 24 by 28 feet. Rope, cord, twine and knitting mill yarns will be made. Steam power will be used. It is expected to have the mill in operation by October 1st. B. J. Love is manager. Goods will be sold direct.

New Jersey, Passaic. The Forstmann & Huffman Company has been incorporated with capital of $750,000. They propose manufacturing yarns and textiles. Julius Forstmann, Ferdinand Kuhn and Geo. Rohlig are the incorporators.

North Carolina, Asheville. The Elk Mountain Cotton Mill Co. has been incorporated with capital stock of $150,000. A building formerly used for textile purposes has been secured and will be equipped with looms for manufacturing table damask, toweling and other similar goods. They propose later on establishing a plant for spinning yarns. D. G. Devenish will be general manager of the new concern. Others interested are F. W. Graham, J. M. Westall and C. H. Miller. Power will be secured from the W. T. Weaver Power Co.

North Carolina, Burlington. The Delta Cotton Mills have been incorporated with capital stock of $12,000. R. W. Stokes, J. H. Holt and J. E. Carrigan are the incorporators.

*North Carolina, Winston-Salem. The Damask Mfg. Co., whose incorporation was recently reported, will build and equip a mill of 2,500 spindles and 85 looms to manufacture damask and other similar goods. W. L. Harper of Winston-Salem is President, I. R. Hayes, Vice-President and Manager and R. S. W. Pegram of Dela Plain, Secretary and Treasurer. The mill will be located at Roaring River in Wilkes Co., operated by electricity.

Ontario, Toronto. The Richter Mfg. Co. has been incorporated with capital stock of $50,000 to manufacture burlaps, art canvas, etc. Mr. P. C. J. Richter, of the Richter Mfg. Co., of Tenalfy, N. J., is understood to be the principal stockholder.

Pennsylvania, Wilkesbarre. John W. Doran, formerly general superintendent of the Wilkesbarre Lace Mfg. Co., at this place, has organized a new company, to be called the Doran Lace Mfg. Co. Capital stock, $100,000, which has been subscribed by local capitalists. Ambrose West, of Plymouth, Pa., a large knit goods manufacturer, is president of the company, William C. Shepard, vice-pres., George J. Stigmear, treas., and Mr. Doran will be secretary and general manager. Site will be selected at once and work on the building started as soon as possible. Nottingham and other lace curtains will be manufactured. Much of the special machinery is imported from England and has been ordered. This makes the third industry of this kind in Wilkesbarre.

*South Carolina, Central. Work is under way installing the machinery in the Isaqueena Mills. It is expected that the plant will be in operation by September.

*South Carolina, Clifton. The Clifton Mill number 3 is ready for the machinery.

*Texas, Paris. W. I. Young of Greensboro, N. C., the promoter of the Otowah Cotton Mills at this place, states that the work will begin on the mill building by August first.

Enlargements and Improvements.

*Alabama, Huntsville. The contemplated addition previously reported for the Lowe Mfg. Co. will increase the capacity of the plant about 15,000 spindles.

Canada, Cornwall. The Canadian Colored Cotton Mills Company is to start a third mill at this place in property recently purchased from the Cornwall Manufacturing Company. The company has been exempted from municipal taxes for a period of ten years. About 150 people will be employed.

*Georgia, Atlanta. The addition to the Gate City Cotton Mills will be completed about Sept. 1st. This addition is to complete their card and picker room, which has hitherto only had a capacity for a 5,000 spindle mill, and they have been operating preparatory machinery, both day and night, to keep us with 10,000 spindles running in the day. When the addition is finished they will have then a complete 10,000 spindle plant, and will

operate during the day time only. They use steam power, and have a dye house, which has never been put in operation.

Georgia, Forsyth. The Trio Manufacturing Company is considering building a new mill.

*Georgia, La Grange. The Dixie Cotton Mills have awarded contracts for additional equipment of about 3,000 spindles, Howard & Bullough American Mch. Co. make. Also about 300 Crompton & Knowles looms.

*Georgia, West Point. The Lang Mfg. Co. is to build a No. 2 mill which will cost about $25,000.

Georgia, West Point. The West Point Mfg. Co., of which H. S. Sears, of Boston, is treasurer, are to make extensive improvements, putting in 10,000 additional spindles and eventually bringing the plant up to 50,000 spindles. A new dam will be built and electrical equipment put in.

Massachusetts, Adams. The Renfrew Mfg. Co. is building a new engine house at its mill in Maple Grove, of brick, 30 by 30, and 25 feet high. Work on the building has been begun by Contractors Waters & Fleming.

*Massachusetts, Fall River. Besides the addition to the power plant of the Durfee mills, reported last week, other changes are to be made and new carding and spinning machinery put in. Thirty-six new spinning frames of Lowell make replace mules thrown out.

*Massachusetts, Fall River. The Luther Manufacturing Company has started installing the machinery in the new weave shed, but they do not contemplate putting machinery in operation before the fall.

Massachusetts, Methuen. An addition about 20 by 70 feet is underway to the Methuen Company's dye house. A new dyeing machine has been installed.

*Massachusetts, North Oxford. Edwin Bartlett, who recently installed 1,200 spindles in the plant, is adding two new spinning machines.

*Massachusetts, Turner's Falls. The addition to the Turner's Falls Cotton Mill is progressing. The power company is building a large new power house, to be equipped with four turbine wheels, and dynamos capable of developing 5,000 H. P. for lighting or power purpose, which will be sold to consumers.

*Mississippi, Magnolia. The Magnolia Cotton Mills, which started up about a year ago with equipment of 5,000 spindles and 150 looms, have placed orders for additional equipment to double their capacity and have begun work on the new building.

Mississippi, Tupelo. At meeting held recently by the Tupelo Cotton Mills, it was voted to issue $40,000 more of capital stock.

New Hampshire, Nashua. The Jackson Company intends making extensive repairs in its water power. The old wheel at No. 6 mill will be replaced by one of the latest improved type. Work on same will be begun shortly. The business of this company is good, the Russian-Japanese war not having disturbed its Eastern trade.

New York, Cohoes. The extensive improvements and installation of machinery to the Harmony Mills which has been in progress since D. S. Johnston took the management, are about completed. Over $100,000 worth of new machinery has been installed and the plant modernized, a large amount of the old machinery thrown out and replaced with new.

North Carolina, Charlotte. The Dover Yarn Mills have increased the capital stock from $90,000 to $180,000, for purpose of making improvements to the mill. They now operate 8,500 ring spindles and 380 looms.

North Carolina, Cliffside. The Cliffside Mills have ordered the complete equipment of their mill with humidifiers, the system to be installed by the American Moistening Company, Boston, Mass.

Pennsylvania, Philadelphia. Joseph Gale & Son, who recently undertook to start up the Hoffman Mill at Angora on woolen yarns, have gone out of business and the mill has now been leased by Shapcott & Weaver, 107 Erie Street, Camden, N. J., manufacturers of cotton and woolen roller covering. The machinery will be removed from Jersey at once and is expected to be installed and in full operation by July 1st.

Pennsylvania, Philadelphia. The Standard Mills of Robert Megowan & Son, Adam and Church Sts., Frankford, manufacturers of Madras cloth and cotton dress goods on 200 looms, which was recently visited and almost destroyed by fire, has been rebuilt, the damaged machinery replaced and new sprinkler system put in including other fire fighting apparatus in an endeavor to make the building as near fire-proof as possible.

Pennsylvania, Philadelphia. New boilers and an automatic stoker are being put in the mill of Robert Beatty & Co., Coral and Adams Sts., manufacturers of fine cotton yarns with 16,814 spindles. This mill, which was shut down over the 4th of July, has not yet been started up owing to the fact that the company is giving its machinery a thorough overhauling.

Pennsylvania, Philadelphia. Moss & Webb, Mascher Street, below Lehigh Avenue, who manufacture upholstery goods and curtains, are about to make an addition of three more Crompton & Knowles looms. The goods are sold direct.

Rhode Island, Pawtucket. The Dexter Yarn Company is making improvements to its property on Broadway, for purpose of removing the plant, now located on East Avenue to same. The old building which has been used as a storehouse, is being fitted up and new floors put in.

*South Carolina, Camden. The old De Kalb Cotton Mills purchased by Morris Israel of Charleston, S. C., will be operated by the Watertee Mfg. Co., recently organized. Charles A. Gambol of Anderson, S. C., is President and Treasurer, Ellison A. Smyth of Pelzer, Vice-President, J. J. Workman of Camden, Secretary. Capital stock will be $300,000. The mill will be remodeled and modernized. The De Kalb Mills contained 10,266 ring spindles, and 260 looms, and manufactured four and a half yard goods.

*South Carolina, Dillon. The Maple Cotton Mills, reported to build an addition to the plant

in which 8,500 ring spindles will be added, contemplate having same in operation about October 1st. This plant manufactures 20s to 30s hosiery and 2 ply yarns.

*South Carolina, Hartsville. The Hartsville Cotton Mills expect to have the additions to the plant completed Sept. 1st. They will then have in operation 30,000 spindles and 750 looms.

*South Carolina, Rock Hill. The Manchester Cotton Mills is changing over from steam power to electric. The plant is shut down for several weeks while the installation of electric machinery is being made.

South Carolina, Williamston. The Williamston Cotton Mills have placed an order for the complete equipment of their mill with humidifiers, to be installed by the American Moistening Company, Boston, Mass.

Mills Starting Up.

*Connecticut, East Killingly. The Whitestone Mills, recently leased by M. H. Marcus and Brother of New York, has been started up after being thoroughly overhauled and adapted to the present line of manufacture, which includes stair pads, carpet linings, cotton comfortables, etc.

Connecticut, Uncasville. The Uncasville Mills, which have been closed for some time, are starting.

Georgia, Athens. The plant of the Athens Mfg. Co., which was recently purchased by R. L. Moss Co., is being entirely remodeled and equipped, as reported in our issue of June 10. The mill will soon be ready to start up.

*Georgia, Gainesville. The Pacolet Manufacturing Company has started operations on half-time in the No. 4 mill, which was closed several months ago on account of high price of cotton.

Massachusetts, Webster. The mills of the S. Slater Co., and the Stevens linen mills, some of which have been shut down and others on short time, will be started up in full.

North Carolina, Concord. The Coleman Cotton Mill, bought under mortgagees sale by J. B. Duke and others, may be started up under the Duke management. If so, undoubtedly the machinery will be overhauled and modernized as there is much machinery in the mill that is not up to date.

*Virginia, Danville. The new mills of the Dan River Power & Mfg. Co., under the same management as the Riverside Cotton Mills, will probably be ready to start up with the new crop. This plant contains 42,000 spindles and 1,620 narrow looms.

Mills Shutting Down.

Connecticut, Versailles. The cotton mills, owned and operated by the Uncasville Manufacturing Co., have been closed for an indefinite period. It is thought that the Uncasville Mills will continue on full time.

Georgia, Dalton. The Crown Cotton Mill will shut down for two weeks when the peach crop is ready, thus enabling employees to get out-of-door work in that time. This shut-down is necessary for the instalment of new machinery and overhauling the whole mill.

Massachusetts, Lowell. The Boott Mills will close Saturday until September 1st. Necessary repairs will be made during the shut down. Unsatisfactory condition of the market and scarcity of cotton are assigned as cause for shut down.

North Carolina, Charlotte. Operations have been suspended in the Charlotte Cotton Mill until the new crop of cotton is received. During shutdown the machinery will be thoroughly overhauled.

Pennsylvania, Philadelphia. The Meehan-Mothes Co., manufacturers of tapestry curtains, couch covers and piece goods, in the Godschalk Mills, 23d and Hamilton Sts., have shut down. It is reported that the plant will not be put in operation again. They operated 59 narrow and 5 broad looms, the main office being in New York.

Rhode Island, Pawtucket. The Coats Thread Mill will be closed down for the last ten days in August.

Rhode Island, Rockland. Ponogansett Mill is closed down for some weeks.

Rhode Island, Valley Falls. The Naushon Company has shut down for three weeks.

WOOLEN.

New Mills.

*California, Los Angeles. The Alfred Dolge Manufacturing Company expects to have the new plant at Dolgeville running before the end of July.

*Maine, Abbott Village. The Moosehead Woolen Company, whose mill was burned in last December, and which has several times been reported as about to rebuild, will probably start work on rebuilding very soon, and the new plant will doubtless be a 4-set mill, instead of two sets, as before. C. C. Emerson is president, and F. H. Drummond of Bangor, treasurer.

*Massachusetts, Fitchburg. The Sherreffs Worsted Co., which is to move here from No. Chelmsford, has filed its plans with the building department for a mill, dye house and engine house 65 by 227 feet, two stories; with one-story ell, 25 by 27 feet; also a boiler house and dye house 40 by 110 feet.

Massachusetts, Franklin. E. E. Waite, son of Enoch Waite, Agent of the American Felt Company's mills, is building a new shoddy mill on the line of the New Haven Road, near the Bassett Straw Works. It is expected to be in operation by October.

*Ohio, Ravenna. We learn further of the Ravenna Worsted Co. that the capital stock is $30,000. It will manufacture worsted yarns, and occupy the building formerly used by the Loudin Shoe Factory. C. G. Bentley, J. E. Richardson, George H. Richardson, F. H. Carnahan and W. J. Beckley are the incorporators. A stock holder's meeting will be held very shortly at which further details will be perfected.

*Pennsylvania, Glen Riddle. Work has started installing additional machinery in the Binz Carpet Mill. When completed the plant will be equipped with 16 carpet looms.

*Pennsylvania, Philadelphia. The newly incorporated Bromley Worsted Spinning Co., with a capital stock of $100,000, has commenced operations at Indiana Ave. and A St., where they are running the plant formerly operated as a part of the Bromley Bros. Carpet Co., consisting of 3 sets of worsted cards, 3 combs, and 3,000 spindles, on worsted yarns for the carpet and dress goods trades, English system. The officers of the company are Thomas Bromley, Jr., president and buyer, and George Bauer, superintendent.

*Rhode Island, Woonsocket. Work is rapidly nearing completion on the brick work of the new Alsace Mill. It is expected to have the plant ready for operations by September.

*Virginia, Winchester. The Virginia Woolen Co., whose plant was recently burned, began rebuilding on July 5th, and expect to get into production again early in September. F. H. Hunt is the superintendent and buyer. The plant will be equipped with four sets of cards and 24 looms. Steam power. They dye raw stock.

Enlargements and Improvements.

*Connecticut, Yantic. The Yantic Woolen Mills will not build an addition to their mills this summer, as was recently reported, but will instal new boiler plant and build chimney.

*Georgia, Rossville. The Park Woolen Mills have recently completed their addition, which is about 25 by 150, to be used to enlarge the dye house and stock room. They have added a new set of 60 inch cards, four new mules, 340 spindles each and 19 new looms. They expect to install a new engine in the fall and contemplate further extension of the buildings and equipment. This mill is crowded with orders and showing a fine lot of samples for the coming season.

Maine, Old Town. It is reported that the Maine Woolen Company contemplates adding two new sets of cards and two new 336-spindle mules in the plant.

Maine, Warren. The Georges River Mills is shut down, during which time a new dam will be built and other repairs made. Another set of cards with other machinery will be put in.

Massachusetts, Chapinville. The Northboro Woolen Mills have installed a new 150 h. p. boiler in the plant.

Massachusetts, Holyoke. Beebe, Webber Co. have finished the addition to their weave room and installed twenty looms.

*Oregon, Union. The Union Woolen Mills, of which John P. Wilbur is superintendent and buyer, advise us that they are figuring now on cost of increasing ther capacity, but have not yet decided whether to do so or not. The mill now operates two sets and 13 looms, and makes blankets and Indian robes.

Massachusetts, Maynard. The American Woolen Company has awarded contract for erection of another addition to the Assabet Mills. The new building will be 100 by 46 feet, one story, and will be used partly for finishing department.

Massachusetts, North Andover. The Brightwood Manufacturing Co. has recently completed installation of additional looms in the plant.

Massachusetts, North Oxford. The Huguenot Mill are installing a new set of woolen cards built by Jas. H. Whittle.

*Massachusetts, Rochdale. Work is under way on erection of a new boiler chimney in Andrew Howarth & Sons' mill.

Michigan, Centerville. Additional machinery is being installed in the Michigan Central Woolen Company's plant.

New Hampshire, Marlboro. A 60 h. p. gasoline engine has been purchased by the Cheshire Blanket Co. for installation in the picker house for furnishing power when water is low.

*New Jersey, Passaic. The new finishing and dyeing department of the Garfield Worsted Mills is almost completed and ready for occupancy. The building is one story, 100 by 125 feet, and in it they will put several new finishing machines in addition to those already in use. They operate 225 looms on woolen and worsted dress goods, which are sold through commission houses in New York. Business with them, they say, is looking up.

New York, Middleville. The Nelson-Dedicke Felt Co. are to build an addition to their mill and will put in more machinery.

Pennsylvania, Bridgeport. The W. Smith Woolen Co. has begun work on the addition which will increase its capacity by three sets of cards and fifteen looms.

Pennsylvania, Bridgeport. Barber's carpet yarn mill has increased its capacity by the addition of another 60-inch set of cards of the Textile Machinery Co.'s make, making five sets in all.

Pennsylvania, Philadelphia. Charles P. Cochrane, manufacturer of Persian, Ingrain and Abusson stair carpets at Howard and Lehigh Avenues, is about to have erected a new mill at the northwest corner of Butler and Jasper Streets. The plans provide for a two-story brick building, 54 by 200 feet, with a one-story rear addition 150 by 78 feet.

Pennsylvania, Philadelphia. The Southwark Mfg. Co. is making improvements in its dye house, which include the addition of an indigo dyeing plant for dyeing union goods in the piece and also raw stock.

Pennsylvania, Philadelphia. The Belmont Woolen Mills, West Manayunk, manufacturing wool and merino shoddies, are installing additional machinery.

Pennsylvania, Philadelphia. W. W. Hitchon, manufacturer of shoddies and dealer in cotton and woolen waste at Thorpes Lane and 16th St., Germantown, has leased the Eagle Mills at Morton and Mechanic Sts., formerly occupied by the late firm of Hilton & Co. Mr. Hitchon will also continue to occupy the old mill on Thorpes Lane, but the main factory and office will be in the Eagle Mills, which he has now in operation.

Rhode Island, Woonsocket. The purchase of land by the Lafayette Worsted Co. near their present plant gives rise to rumor that they will build.

Tennessee, Jefferson City. The Jefferson City Woolen Mills will build a considerable addition to their plant. It will be of brick structure. This concern at present has one set of cards and 48 looms, and makes up its product of jeans and cassimeres into overalls and pants.

Tennessee, Knoxville. The Knoxville Woolen Mills Company has filed an application for an amendment to charter for purpose of increasing the capital stock from $600,000 ao $750,000.

Mills Starting Up.

Connecticut, Killingly. The Davis & Brown Woolen Company has started up on full time. It has installed a new engine and equipped its plant with electric lights.

*Connecticut, Montville. The purchasers of the Cochegan Woolen Mills, formerly the Montville Woolen Mills, under referee's sale, are A. H. Arnold, W. H. Gilbert, of Providence, and W. D. Hawkins, of Montville. The latter will be the superintendent. The plant has been started up on men's wear.

Maine, Warren. The woolen mill has resumed operations. Steam power will be used in the plant until new dam is completed. Two new sets of cards have been installed.

*Massachusetts, Auburn. Operations have been resumed in the Pondville Woolen Mills, which were closed for purpose of making repairs necessitated by recent fire.

Massachuseetts, Brookfield. One of the shoddy mills of Mann & Stevens which has been closed for some months is started up again.

Massachusetts, Byfield. Operations have been resumed in the Byfield Woolen Mills after a two weeks' shut down.

*Massachusetts, Monson. The Heritage & Hirst Mill, which we reported purchased by the Beech Bros. of the Sterling Mill, Bridgeport, Penn., is being started up on men's wear.

Massachusetts, Stoneville. The strike at the Hogg Carpet Mills, which caused a shut down of the plant for the last three weeks, is off and mills started up.

*Missouri, Sedalia. The Sedalia Woolen Mill property has been purchased by M. D. Moore and L. H. Schwald of Cole Camp and Frank Hugelman, of California, Mo. The plant is being remodelled and will have one set cards and 5 broad looms for manufacturing cassimeres and flannels. Frank Hugelman will be agent and manager of the plant and B. A. Churchill, superintendent. Company will operate as the Queen City Woolen Mfg. Co.

New York, Albany. F. C. Huyck & Sons' mills will reopen Monday, the 18th, after being closed 10 days in order to make various improvements. The new 75-foot addition is completed. in which knitting looms have been installed. These mills now employ 250 hands.

New York, Waterloo. The Waterloo Manufacturing Company's mill, which closed during July, expect to start up in August on full time. During the shut down they are repairing the water power plant and making other necessary improvements.

Ontario, Killaloe. Operations have been resumed in the Killaloe Woolen Mills, which have been closed for some time, by M. Roche, Jr., & Co.

*Pennsylvania, Aston Mills. Operations have been resumed on the looms in the May Manufacturing Co.'s plant. The plant is expected to be running in full soon.

Pennsylvania, Chester. The Irving & Leiper Mfg. Co., which has been closed for several months, is starting up again.

Pennsylvania, Chester. The Grove Worsted Mill operated by F. A. Strauss & Co., which has been shut down for several months, has been started up again.

*Pennsylvania, Glen Riddle. The Woolen Mill at this place is being started up on low grade men's wear. F. L. Putney is president. He was formerly at Downington, Pa.

Personals.

Cotton.

Charles S. Smart, formerly of the Bala Mill and Gibson Mill, Concord, N. C., has secured a position as superintendent in Clinton, S. C.

H. E. Brann and family spent a week's vacation in July in the country at his parents' home. J. H. Brann is overseer of dressing in Bates Mill, but finds time to run a small farm.

Robert Bent has resigned as overseer of finishing at the Pacific Mills, Lawrence, Mass.

Enoch Cheney, overseer of carding at the Danielson Cotton Co., Danielson, Conn., has resigned.

Alfred Hawksworth has resigned as manager of the Merchant's Cotton Company, Montreal, Que.

William Griffin has resigned as superintendent of the Palmetto (Ga.) Cotton Mills.

Robert Fraser, who has been secondhand of the No. 2 lower weave room in the Bates Mill, Lewiston, Me., for the past thirteen years, has been promoted to the position of overseer, succeeding John Tilton, deceased.

A. M. Hatheway, overseer of twisting at No. 2 mill of the Willimantic (Conn.) Mills Company, American Thread Company, has been succeeded by Fayette Goss, who has been secondhand to Mr. Hatheway for many years.

J. W. Brown has been made superintendent of the American Pad & Textile Co.'s new cotton mill at Cartersville, Ga., and assumed the duties July 1. Mr. Brown has been eighteen years with the Crown Mills, of Dalton.

J. Thompson succeeds W. J. Thompson as superintendent of the Holt-Granite Mfg. Co., Haw River, N. C., who resigned to become superintendent of the Elmira Cotton Mills Company, Burlington, N. C.

Howard Gray, who recently resigned as superintendent of the Cocheco Manufacturing Company, Dover, N. H., has been appointed superintendent of the Oriental Print Works, Apponaug, R. I.

Alexander Hobbs has resigned his position as superintendent of the Merrimack Print Works, Lowell, Mass., but will not sever his connection with the company immediately. Mr. Hobbs' assistant, Percy Guilline, has been appointed to the position, pro tem.

Alphonse Thibault, formerly of the Border City Manufacturing Company, has been engaged as overseer of weaving at the Bourne Mills. Fall River, Mass., to succeed George H. Murray, resigned.

W. M. Cameron has resigned as dyer in the Winder Cotton Mills at Winder, Ga., and is now temporarily located in Charlotte.

J. W. Brown, superintendent of the Crown Cotton Mills, Dalton, Ga., has resigned.

William Bowden has resigned as overseer of weaving at the United States Finishing Company's mill at Norwich, Conn.

John Mayes, formerly of Gastonia, N. C., will become superintendent of the Fitzgerald, Ga., cotton mills.

Frank L. Page, of Henderson, N. C., has been appointed superintendent of the Statesville (N. C.) Cotton Mills, to succeed A. B. Saunders, resigned.

D. S. Warner, for many years in charge of the sample room of the Chicopee Mfg. Co., Chicopee Falls, Mass., has resigned.

F. L. Page, formerly superintendent of the Harriet Cotton Mills, Henderson, N. C., has accepted a similar position with the Statesville, N. C., Cotton Mills. Robert H. Craig, assistant superintendent at the Harriet Cotton Mills, has been promoted to the superintendency.

W. L. Robbins has succeeded J. T. Redman as superintendent of the Manetta Mills, Lando, S. C. Mr. Robbins was formerly superintendent of the Continental Manufacturing Co., Charlotte, N. C.

J. F. Gainer, late of Nashville, Tenn., has taken charge of the Wennonah Cotton Mill, Lexington, N. C., as superintendent and overseer of weaving.

S. D. Anderson succeeds John Howard as superintendent of the Pendleton Mfg. Co., Autun, S. C.

J. H. Grau has resigned as superintendent of the Springstein Mills, Chester, S. C., and is succeeded by Mr. Hadfield of Concord, N. H. Mr. Grau will travel for a New York dye house.

Earl S. Jenckes of Woonsocket, R. I., has been engaged as superintendent of the Paul Whitin Manufacturing Co.'s plant at Northbridge, Mass., to fill the position left vacant by Henry S. Houghton, who goes to Montreal. Since 1896 Mr. Jenckes has been in the employ of the Draper Machine Co. of Hopedale, acting as traveling agent and supervising the setting up of machinery in Europe as well as the United States.

Woolen.

A. F. Ford has been appointed assistant superintendent at the Lippitt Woolen Company's mill at Woonsocket, R. I. Mr. Ford has been with this company for the past five years in the capacity of bookkeeper, and will combine his duties in that office with his new responsibilities.

W. H. Reddick has been engaged as superintendent by the Park Woolen Mills, Rossville, Ga.

James Dobson, formerly with the French River Textile Co., Mechanicsville, Conn., has taken charge of wet finishing in Malone, N. Y.

George Crossland, superintendent of the Bemis Mills, Bemis, Mass., has resigned in order to give his undivided attention to the Rutland Mills, which he will start up at once.

Riley Firth, who has been connected with the Hartford Carpet Company as overseer and superintendent at their New York mills for many years, has resigned. The entire plant of this company is now at Thompsonville, Conn.

Robert Illingworth has resigned as superintendent of the Northboro (Mass.) Woolen Mills, after fifteen years' service.

William J. Murray, Utica, N. Y., has been appointed superintendent of the Peace Dale Manufacturing Company at Peace Dale, R. I.

P. H. Duffy has accepted the position of overseer of carding for the Fabyan Woolen Mills Co., Stafford Springs, Conn.

J. F. Maguire has resigned as superintendent of the Williamette Valley Woolen Mfg. Co., Eugene, Ore.

Samuel Brierly, who has had charge of the finishing department of the Bowden Felting Mills, Millbury, Mass., since February ,1900, has sent in his resignation, and will take a position in New York.

Thomas Munn has resigned as superintendent of the Jamestown (N. Y.) Worsted Mills.

Patrick Coffee, overseer of spinning at the Atlantic Mills, Providence, R. I., has been succeeded by Arthur Wilson, Manchester, N. H.

T. C. Scott, who has had charge of the carding department of the Paton Mill, Sherbrooke, Can., for the past four years, has resigned, to fill a more responsible position.

Henry Busier, overseer of spinning with the J. L. & T. D. Peck Woolen Co., Pittsfield, Mass., has resigned, and is succeeded by William H. Brierley, formerly of West Troy.

T. J. Sexton, overseer of carding, has severed his connection with the Raritan (N. J.) Woolen Mills.

William Wilcox is overseer of carding for the Aetna Mills, Watertown, Mass. He was formerly in a similar position with the Madison (Me.) Woolen Co.

Alexander Costine has secured the position of overseer of weaving at No. 2 mill of the Peck Manufacturing Company, Pittsfield, Mass.

William Grandage, late of Coventry, R. I., has taken charge of dyeing at the Southwark Mills, Philadelphia, Pa.

John Kernan has resigned as overseer of carding for the Crawshaw Carpet Co., Newburgh, N. Y.

Alexander Costine, formerly with Southwark Mills, Philadelphia, has accepted a position with the J. L. & T. D. Peck Co., Pittsfield, Mass., as overseer of weaving.

Henry C. Taylor has accepted the position of overseer of carding at the Eagle Felting Mills, Lestershire, N. Y.

E. H. Boyce, formerly of Hanover, Ill., is now finisher at the Clinton (Mich.) Woolen Mills.

Miscellaneous.

Lyman B. Brainerd has been elected president of the Hartford Steam Boiler Inspection & Insurance Company, to succeed J. M. Allen. Mr. Brainerd was formerly manager of the Bond Department of the Equitable Mortgage Co., and about ten years ago went to Hartford to assume the position of assistant treasurer. Five years later he became treasurer of the company, and still retains this office as well as the presidency. Mr. Brainerd is a director in a number of corporations and business enterprises in Hartford. The present board of officers now comprises the following: Lyman B. Brainerd, president and treasurer; Francis B. Allen, vice-president; Joseph B. Pierce, secretary; Louis F. Middlebrook, assistant secretary.

Walter H. Whiteside is the new general manager of sales for Allis-Chalmers Co. Mr. Whiteside has, until within very recently, occupied a most important position in the Westinghouse organization, having been the manager of the detail and supply department of the Westinghouse Electric & Manufacturing Company of Pittsburg, and at the same time general manager of the Sawyer-Man Electric Co. of New York. His experience has been by no means confined to the electrical field. His first business connection dates back to 1881, when he entered the employment of the Hercules Powder Company. He introduced their high explosive products into the Lake Superior regions, and four years later became associated with the Cleveland Electrical Mfg. Co., serving in various capacities for the first two years and the remainder of the twelve years with them being the manager of their Chicago office. Mr. Whiteside is a man of force and also of delightful personality. He is well known throughout the country, and everyone who has had dealings with him has confidence in him, because he is a man who keeps his word, whether he speaks it or writes it.

Deaths.

J. C. Midgley, former superintendent of Barre Woolen & Combing Company at South Barre, Mass., died July 24th from heart disease in New York. Mr. Midgley was 42 years old. He had worked in woolen mills since he was 7 years old, most of the time in England. His wife and four sons, ranging in age from 4 to 13, survive him.

Daniel Pendergast, general manager of the Gloversville (N. Y.) Felt Company, died recently.

Frank Tiffany, Bennington, Vt., formerly of the firm of Tiffany Bros., manufacturers of knit goods, and also manufacturers of knitting machines, died suddenly at the home of his daughter in Southampton, Mass. Mr. Tiffany was born in England sixty-eight years ago, and came to this country at an early age and has been connected with knitting interests all his life. He was widely known in textile circles. A widow, one son and three daughters survive.

A. S. Matheson, for 50 years superintendent of the Eagle & Phenix Mills, Columbus, Ga., died June 25th, aged 76 years.

Herbert R. Sayles, superintendent of Richard Sayles & Co.'s mill at Uxbridge, Mass., died on June 30th, in his fifty-second year. Early in his career he was engaged in the shoddy business, traveling through the East for F. Mulhauser & Co., of Cleveland, O. He then took charge of the Uxbridge mill for his father Richard Sayles and has manufactured woolen goods ever since.

Henry H. Townsend of Milton Mills, N. H., died recently. In the early seventies he formed a copartnership and commenced the manufacture of felt goods for the rubber trade, etc. Later he built a new mill and began weaving blankets. This mill has since been enlarged and refitted with the most modern and up to date machinery and is considered one of the best equipped mills in the state. Mr. Townsend will be very much missed, not only by his only family, but by a very wide circle of friends and by his employees.

T. E. B. Knowles, for three years treasurer of the Riverside Woolen Company, Pittsfield, Me., died at Monson, Mass., recently, aged 47 years.

William Welsh, traveling representative for the Draper Company, Hopedale, Mass., died at his home July 11th, after an illness of some time. Mr. Welsh was probably known to every cotton manufacturer and superintendent and overseer of spinning in the country, through his long connection with the Draper Company and its predecessor, George Draper & Son, and was an authority on all matters pertaining to spinning, spooling and warping. Many a manufacturer and overseer owes him a debt of gratitude for timely assistance and valuable information. Mr. Welsh was about 70 years old at the time of his death. He will be missed by a wide circle of friends.

Major Alonzo B. Valentine died from heart disease at his home in Bennington, Vt., July 2. He was seventy-four years of age. For forty years he was engaged in the knit goods business, a large part of the time as president of the Valentine Knitting Company, which he organized.

Alfred Metcalf, one of the most prominent manufacturers and mill men of Rhode Island, died at his home in Providence after a short illness. He was born in this city seventy-five years ago. When, in 1864, the late Jesse Metcalf, his brother, Henry Steere and Stephen Olney founded the Wanskuck Company, he became associated with them, and continued to be an officer of that company until his death. A widow and three sons survive him.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

Jute and Linen Weaving, Part 1, Mechanism; by T. Woodhouse and T. Milne; Emmot & Co., Manchester, England. Price $2.50.

Nearly all the books so far published on the subject of weaving have treated more particularly of the weaving of cotton and woolen goods. While these comprise the most important part of textile products, the linen, jute and hemp industries seem to be of sufficient importance to warrant a text book on weaving devoted to that particular branch of the subject. It is to supply this want that the present volume has been written. Following is an abstract of the table of contents: Yarn Counts; Reeling, Bundling and Setting; Warp Winding; Weft Winding; Warping, Beaming and Dressing; Drawing-in; Reeding and Weaving; Shedding; Tappet Driving and Setting; Jacquards; Picking; Let-off, Take-up and Box Motions; Centre and Side Selvages, etc. This volume treats only of the mechanism of weaving and it is the intention of the authors to follow it with a second volume on the structure of the fabrics and textile calculations. The work is carefully writen by men who are evidently thoroughly informed on the subject. It is profusely illustrated and typographically all that could be desired.

Waterproofing of Fabrics; by Dr. S. Mierzinski; D. Van Nostrand Co., New York. Price $2.50.

This is the English translation of a German work which has found a large sale in German speaking countries. Abridgments of the English waterproofing patents granted to May, 1903, have been added to the original work, which was published in 1897, in order to bring the translation up to date.

Blue Book: The 1904 edition of the Blue Book textile directory has been issued, and in addition to its features of former years, a list of cotton and wool dealers has been added. The present issue is a World's Fair edition, the Office Edition being illustrated with colored prints of the exposition buildings. The Blue Book contains a directory and report of textile manufacturers in the United States and Canada, and this edition shows every evidence of the same care and thoroughness in compilation of previous years. It is published in two editions. Office Edition, $4.00; Traveler's Edition, $3.00. Davidson Publishing Co., 401 Broadway, New York.

American Buyers' Directory, 1904; The Trades Publishing Co., Philadelphia, Pa.

This directory gives a carefully classified list of manufacturers, importers and jobbers of carpets, upholstery goods, rugs and kindred products. The list includes brands and trade mark names used in the furnishing industries, mill-titles, selling agencies, jobbers and department stores handling carpets and upholsteries. The 176 pages contain valuable information for every dealer in floor coverings and upholstery goods, decorators and interior furnishings generally.

Carding and Spinning; by G. F. Ivey; G. F. Ivey & Co., Hickory, N. C. Price $1.25.

This condensed treatise on cotton carding and spinning has been compiled by Mr. Ivey, assisted by Eben Willey, Allenton, R. I., and H. D. Martin, Fall River, Mass. It contains a clear description of the various processes of carding and spinning, the scope of the work being indicated by the following abstract of the table of contents: Cotton; Bale Breakers; Cards; Yarn Numbering; Ring Spinning; Mule Spinning; Spoolers; Warpers; Manufacture of Fine Yarn.

Books on Textile Industries and Wearing Apparel; Patent Office, London, England. Price 50 cents.

This is a list of books on textile industries and wearing apparel in the library of the British patent office, including the chemical technology of textile fibres. Owing to the very complete collection of works on the subjects mentioned this list is of special value as a work of reference.

The Mechanical Index for 1904. Published by Industrial Press, 66 West Broadway, New York, N. Y. $7.50.

This comprehensive work is a complete index with the names and addresses of all manufacturers in the United States of mechanical appliances, machinery and tools operated by steam, electricity, water, hand or foot power. It is carefully arranged and classified under special headings for quick reference, with a concise definition of the use for which each appliance is designed. The different sections are as follows:—

Section 1.—Electrical Apparatus; 2.—Steam Appliances and Power Transmission; 3.—Railway Equipment; 4.—Printing, Bookbinding and Paper Making Machinery; 5.—Textile Machinery; 6.—Hoisting and Conveying and Mining Machinery; 7.—Agricultural and Flour Mill Machinery; 8.—Woodworking Machinery; 9.—Machine Tools and Metal Working Machinery; 10.—Miscellaneous.

The book has been compiled from a strict standpoint of impartiality and with an earnest effort to include all manufacturers under their proper headings. For corporations and large buyers of various kinds of machinery, it will be a great convenience. It contains over a thousand pages. The Textile Machinery Section, which we are most able to judge of intelligently, is comprehensive and accurate, there being few omissions or serious inaccuracies.

Aluminum Products for Textile Purposes (Produits en Aluminium aux Industries Textiles); Philippe Renouard, Paris.

This is a report by M. Edouard Simon of the aluminum products manufactured by M. E. Du Pasquier for textile uses. Owing to its lightness and durability aluminum is peculiarly well adapted for bobbins, spools, etc. This material is not yet used extensively for these purposes, but this report would indicate that there is a growing demand for aluminum spools and bobbins.

Business Literature.

Circular of the Philadelphia Textile School, 1904-05.

This years' edition of this circular is especially interesting on account of the numerous illustrations supplementing the information usually given regarding the organization of the school, its equipment, courses, etc.

The Year Book for Colorists and Dyers, 1903; H. A. Metz & Co., New York.

Part 1 of this year book consists of tables of weights and measures, thermo-metric equivalents; sulphuric acid percentages; hygro-metric equivalents; specific gravity of acid solutions, and symbols of the atomic weights in the elements. In Part 2 the dyestuffs in common use are classified and defined. Part 3 is an abstract of the important patents for the year relating to the dyeing and chemical industries. Part 4 consists of a large number of notes on the different processes of dyeing, printing, etc. Part 5 is the educational section, containing notices of the different American textile schools and new books relating to dyeing and chemistry. Part 6 is a list of dyestuffs, for each of which the makers' name and the dyeing method are given. Part 7 is a collection of miscellaneous notes on various subjects relating to the textile industry. Part 8 is an index enabling quick reference to be made to any subject referred to in the year book.

Fall River and Its Manufactories; by Henry H. Earl; Geo. E. Bamford, Fall River, Mass.

This is a very interesting and useful handbook relating to the industries of Fall River. It contains a brief sketch of the development of Fall River, a list of the institutions, bond issues, and much detailed information regarding the cotton mills which contain 3,246,468 spindles and turn out 945,300,000 yards of cloth per year.

American Carpet and Upholstery Journal.

Notice has been sent to the trade to the effect that The "American Carpet and Upholstery Journal" of Philadelphia will hereafter be issued, beginning with the July number, on the 10th of each month instead of the 1st. This journal has been published continuously in Philadelphia since 1875, the past 21 years having been under the same management headed by John R. Kendrick. This journal has been very successful and has a larger circle of patrons and readers now than ever before.

New Bedford Textile School, New Bedford, Mass.

We have received a copy of the catalogue of the day department of the New Bedford Textile School. The information it gives includes a list of the officers and members of the staff, calendar of the terms, sketch of the courses, etc. It is illustrated with a number of excellent views of the interior and exterior of the school.

The Hungerford-Elfreth Systems. Philadelphia Water Purification Co., Philadelphia, Pa.

An illustrated folder describing various types of the Hungerford-Elfreth filters.

Jeffrey Century Rubber Belt Conveyors; The Jeffrey Mfg. Co., Columbus, Ohio.

A forty-eight page illustrated catalogue and price list of the many types of rubber belt conveyors manufactured by this well known concern.

Rope; American Manufacturing Co., New York City.

An illustrated price list of the Manila, sisal and jute rope and twines manufactured by the American Manufacturing Co. A copy will be sent free of charge upon application.

Slipping Belts; Conditions, Causes and Cures; Joseph Dixon Crucible Co., Jersey City, N. J.

An interesting booklet giving much useful information regarding the causes and remedies of slipping belts. A copy will be sent on application.

Mason Reducing Valve Parts; The Mason Regulator Co., Boston, Mass.

A price list of the various parts of the Mason reducing valve. Copies will be mailed upon application.

Jeffrey Water Elevators; Jeffrey Mfg. Co., Columbus, Ohio.

An illustrated booklet and price list of the water elevators built by this well known concern.

The Crompton-Thayer Loom Co. shipped early in August to the Beebe-Webber Co., Holyoke, a large order for looms. They also have received an order from the Earnscliffe Worsted Mills, Providence. The works are running in full, and will continue to do so. The new addition will be ready for occupancy September 1st.

New Manager for Providence Office.

The Cassella Color Co. have appointed Mr. E. L. E. Drake, manager of their Providence office, in place of Mr. John C. Hebden, resigned. With Mr. Drake will be associated Messrs. Homer Winslow and E. T. Harrall, both of whom have been connected with their Providence district for years.

The "New Broom Sweeps Clean."

The broom manufactured by the Philadelphia Brush Mfg. Co., 123 Green St., Philadelphia, made of bassine fibre, is claimed to wear six times longer than the ordinary corn broom. Its cost is only a very little higher, but in consideration of service rendered, it makes it far cheaper. A number of textile mills and factories are using this broom with great satisfaction, and the company solicits a trial order, being fully convinced that they will receive duplicates as a result.

The Pittsburgh Gage & Supply Co., Pittsburgh, Pa., has installed continuous oiling systems, using the White Star oil filter in the Carnegie Steel Co., Homestead, Pa.; Nashville Railway & Lighting Co., Nashville, Tenn.; Allegheny City Lighting Station, Allegheny, Pa.; Henry Phipps Power Plant, Pittsburgh, Pa., and Harris Steam Engine Co., Providence, R. I., works.

Keystone Fast Black Dye Works.

John Boston, proprietor of the Keystone Fast Black Dye Works, 1929 Westmoreland St., Philadelphia, reports that business in his line is picking up. He is doing a good business in fast blacks and reports having done quite a large business this summer in dyeing colors on hosiery, especially tans. Mr. Boston, some few weeks ago, met with a very painful accident. While fixing one of his hydro extractors which refused to work properly he was whirled around the shaft, which almost resulted in his death. He is now well again and back at the dyehouse attending to its operations.

A Cloth Folding Machine.

A new folding machine has been installed in the finishing room of the Pontoosuc (Mass.) Woolen Mfg. Co., which was built and erected by the Arlington Machine Works of Arlington Heights, Mass. An illustrated circular of this folding machine has been prepared which may be obtained on application to the builders.

Transportation at St. Louis.

The St. Louis Transit Company, which operates the larger part of the street car system in St. Louis, has found itself short of power ever since the World's Fair began to attract large numbers of visitors. The traction plant was working at an almost constant fifty per cent. overload, and at rush hours the excess reached extreme proportions. The railway company have now applied to the World's Fair authorities for additional power, with the result that Governor Francis and the Fair administration have, by contract, put at the service of the railway company during the day, from 2 p. m. until 7 p. m., when the loads are heaviest, the service of the huge Allis-Chalmers engine in the Machinery Building. This engine, which is coupled to a Bullock electric generator, and which, when operating at 75 revolutions per minute, at a steam pressure of 150 lbs., and operating non-condensing, is capable of developing 8,000 horse-power, is the central feature of the Machinery Building. From 8 p. m. until the fair grounds close this powerful unit supplies the current for the decorative lighting of the buildings and grounds, which forms the most conspicuous attraction of the exhibition. The lighting requires 200,000 incandescent lamps. The traction load which the engine and generator will now carry by contract between the railway company and the exhibition authorities will be at least 3,000 horse-power to begin with, and may be much increased as the crowds are augmented. It is this engine which has won, at St. Louis, the popular name of "The Big Reliable."

The Somersville (Conn.) Mfg. Co., after careful consideration of the matter, have placed their contract for economizer with the Green Fuel Economizer Co., the sole makers in the United States of this well-known specialty.

Old Home Week in New England.

New England is preparing for her annual reunion, "Old Home Week." In Massachusetts and New Hampshire it is a popular and permanent institution firmly established, and the other states and even the Maritime Provinces and Newfoundland have this year fallen into line so that "Old Home Week" will be in vogue from Connecticut to Labrador. Massachusetts calls back her stray folk to the quiet valleys and meadowlands, back to her interesting and quaint old cities and her picturesque towns on the Atlantic coast; Maine from August 14th to 20th will assemble in her delightful Pine lands or along her "ozoned" coast her scattered children, and during the same period, the hills of Vermont, the historic waters of Champlain and Memphremagog are inviting the sons and daughters of the Green Mountain State. From August 20th to 26th the "Old Granite State" will harbor her visitors and the mountains and lake resorts will teem with life and gaiety. The Newfoundland "Old Home Week" occurs August 3d to 10th.

For further information in regard to "Old Home Week" celebration apply to D. J. Flanders, General Passenger and Ticket Agent, Boston & Maine Railroad, Boston.

Tapes and Bindings.

Since removing to their new mill at Cottman and G Sts., Ryer's Station, Philadelphia, Pa., on the P. & R. Ry., Messrs. Hoffman, DeWitt & McDonough, manufacturers of tapes, webbing and bindings, and their Diamond Stay bindings, of which they make a specialty, report that they have been steadily employed running their looms on this class of goods, in fact several of their old customers alone have given them enough orders to keep them going full time for many days to come. They are operating 20 looms and selling the goods direct.

A Practical Hint.

Sizing colored warps or sizing by the chain system may prove very expensive if the right kind of material is not used, especially if the threads stick together. To give a smooth strong sized warp, and to keep the threads open so that they will separate easily both in the beaming and weaving are very desirable objects. Practical cotton weavers state that excellent results are obtained by using Sizoleum and Soluble Softening Oil, manufactured by the Arabol Mfg. Co., 100 William Street, New York. They are used either with corn or potato starch.

H. Bauendahl & Co.

The Beaver Dam Woolen Mills, Beaver Dam, Wis., have completed arrangements with H. Bauendahl & Co., 61 Worth St., New York, by which the last named firm are the exclusive selling agents for these well known mills, manufacturing tricot longs, thibets and fancy suitings.

Visit of the British Institute of Mechanical Engineers to Milwaukee.

The recent visit of representatives of the Institute of Mechanical Engineers of Great Britain, to Milwaukee, in response to an invitation from the president of the Allis-Chalmers Co., was described by President Wicksteed, of the Institution, in his speech at West Allis, as "one of the pleasantest experiences that had come to the members during their American visit."

"I do not know how these things are done," said he, "but this excursion has been perfectly managed. Two or three days ago in Chicago I met the president of this great company, and incidently remarked to him that I had long desired, as I knew many of my fellow members had, to visit the famous engine works in Milwaukee. President Warren asked 'when will it be convenient for you and your fellow members to come?' and I replied 'the day after tomorrow,' and here we are, transported in some sort of a magical way, quietly, comfortably, without any apparent effort, by arrangements which can only have been made over night and yet are so admirably planned and carried out that they could not have been excelled had they been a long time in preparation. From the time we left the breakfast table in Chicago until we return there in the evening, every movement has been thought out for us and every comfort provided. I want to say in behalf of the officers and council and members of the Institution that this is the kindest and most thoughtful and most generous thing that has happened in my experience of travel. This day, in one of the model engineering works of the world, is one that no member of our Institution now present will ever forget."

President Wicksteed, Secretary Worthington and other members of the Institution said that in the way of industrial sights they had never seen anything more impressive than the huge erecting shop of the Allis-Chalmers Co., filled as it is with engines ranging from 30 to 12,000 h.p. in process of construction.

A Choice Pleasure Section.

To take himself to a picturesque and delightful place for a vacation is the one motive of every vacationist and where will be found a greater selection than on the North Jersey Coast. First to reach the Jersey Resorts is a delightful harbor trip on one of the palatial steamers of the Sandy Hook Line. The voyage down the harbor is delightful at all times and especially so on a hot summer's day. When Atlantic Highlands is reached, one takes the train and from there on there is one successive outlook of pretty homes, vast estates and gay beaches and at all times the traveler is in sight of old ocean. The resorts which cater to the tourist are Atlantic Highlands, Normandie, Seabright, Monmouth Beach, West End, Hollywood, Long Branch, Elberon, Allenhurst, Deal Beach, Asbury Park, Ocean Grove, Belmar, Avon, Spring Lake, Manasquan and Point Pleasant. If you want to know about their charms and beauties send 6 cents in stamps to C. M. Burt, G. P. A., New Jersey Central, New York City.

Knowles' "Express" Pumps.

Bulletin K-73 describes the "Express" pump recently designed by the Knowles Steam Pump Works, New York. This pump is of the reciprocating type and is directly connected to an electric motor without gears or belts, and a 250-gallon pump runs at a speed of 300 revolutions per minute. In a test, the details of which are given, this pump showed an efficiency of 93 per cent. Pumps of this type are built in capacities of from 200 to 4,000 gallons per minute and for heads from 100 to 2,000 feet.

A. N. Dubois, 2170 Sedgeley Ave., Philadelphia, Pa., has just issued a comprehensive circular, giving full information about the ten specialties which he manufactures for fast black hosiery and yarn dyers and bleachers. It also contains a supplementary price-list, and may be had upon application at the above address.

A European Trip.

W. F. Warden, president and general manager of the Burt Mfg. Co., of Akron, Ohio, has just returned from an extended business and pleasure trip abroad, having visited England, France, Germany, Switzerland, Norway, Sweden, Italy and Spain, calling upon the regular agencies of his company, and establishing new ones.

He reports that he has had a profitable trip, having formed many new and desirable connections while abroad, in addition to looking after the stock of the old agencies. Cross oil filters are known wherever lubricating oil is known. While in England, Mr. Warden personally sold one of the large size Cross oil filters to Bryant & May, the English representatives of the Diamond Match Co. He also combined pleasure with business and visited all the points of interest to tourists and brought home many valuable souvenirs from these various places. He reports that he feels greatly benefited physically by his trip and is prepared to take hold of the business again with renewed interest and energy. While in London, Mr. Warden secured an order from his British agents for 150 oil filters and exhaust heads, which is the largest single order for goods of this kind that has ever been given.

Passed the Examination.

At the recent civil service examination at Boston for chief examiner of machinery U. S. customs service, at which 30 applicants from all sections of the country competed, but three passed as eligible, of which two were from the Lowell Textile school, one being instructor in mechanical engineering, and one an evening graduate from Lawrence.

Wellesley (Mass.) College has purchased a large economizer to be used in heating the water for domestic purposes and also the feed water for the boilers. The order was placed with the Green Fuel Economizer Co., through their Boston office, 1053 Exchange Building.

The Lunkenheimer Exhibit at St. Louis.

In Machinery Hall, location 5 G, block 26, is the unique exhibit of the Lunkenheimer Company. It is easily identified by a large model of their familiar valve in hand, which occupies a prominent corner of their exhibit, as shown by cut.

Pyramids of globe, angle, cross, lever and gate valves, of various designs and sizes, both brass and iron, are artistically arranged about the exhibit, and are agreeably off-set by a black plush curtain at the side and rear.

The glass cases arranged in front of the exhibit contain a smaller class of the goods manufactured by them, such as lubricators, oil and grease cups, cocks etc., of all sizes. Neat designs of racks containing various sizes of whistles, injectors, pop valves and a variety of other specialties, lend to make up an exhibit worthy of notice. A new design of water gauge, and oil-pump for cylinder lubrication, are features in themselves.

Dispersed about the exhibit are pipe fittings of every description, together with whistles, safety and check valves and numerous other appliances.

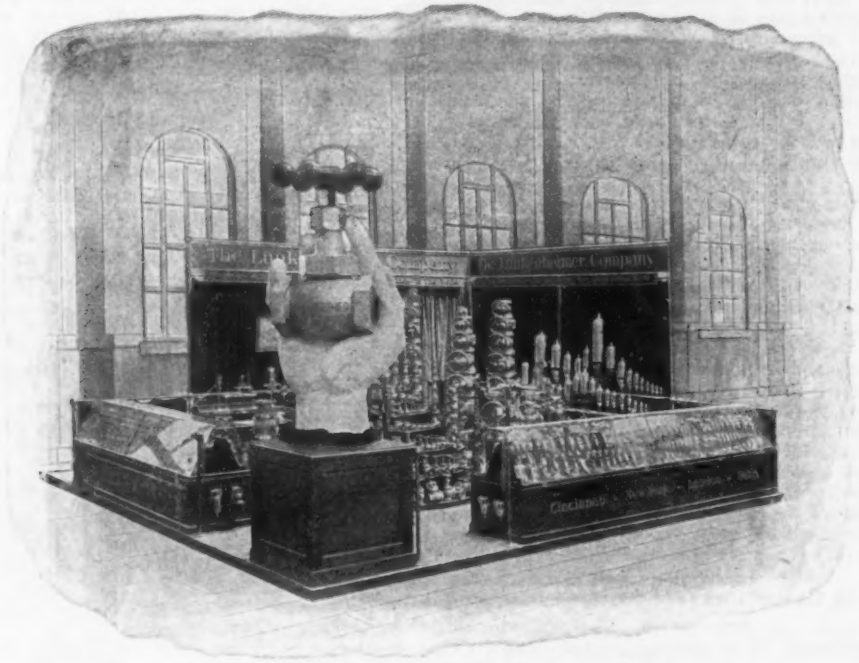
The large variety of steam goods exhibited by the Lunkenheimer Co. and manufactured by them, necessitates more than a casual glance to thoroughly appreciate the exhibit in all its details.

Boston & Maine's Booklet on Exposition.

The St. Louis Exposition is daily drawing large crowds, and the attendance thus far has surpassed the opening month at Chicago.

The Exposition is startling in the completeness of such an enormous and magnificent spectacle. The amusement feature known as the Pike is really marvelous; however, the same may be applied to other portions, and to mention the points of interest would require much space.

If you contemplate visiting St. Louis, send to the Passenger Department, Boston & Maine Railroad, Boston, for their illustrated booklet telling about the Exposition. It will be mailed upon the receipt of a postal card.



THE LUNKENHEIMER EXHIBIT AT ST. LOUIS EXPOSITION.

Removal.

Messrs. Sykes & Hall announce their removal on July 1st to 132 Chestnut St., Philadelphia, Pa.

R. B. Denny.

Among the transactions recently negotiated by R. B. Denny, agent for the sale and leasing of mill property, 143 Federal St., Boston, Mass., are the following: River Mills, Otter River, Mass., sold to Leland & Co.; Berryman Mill, West Buxton, Me., leased to M. & R. Brier.

Dissolution of Partnership.

Announcement has been made that the partnership heretofore existing between J. W. Linnehan and A. M. and W. E. Newbert, under the firm name of Linnehan, Newbert & Co., doing business at 185 High Street, Boston, Mass., has been dissolved.

Textile Bank for Philadelphia Textile Manufacturers.

A new bank, to be known as Textile National Bank, has been organized, with a capital of $200,000., and $50,000. surplus, for the special convenience of textile manufacturers. The officers of the institution are men who are thoroughly familiar with the peculiar trade conditions in the textile industry, and the bank seeks the accounts of manufacturers in this line. John H. Bromley, Jr. will be president of the new institution.

"Two factors led to the organization of the Textile National Bank," said Mr. Bromley. "The first was trade conditions, the other the necessity of another bank uptown. In the textile trade long-time accommodations are essential, and the varying prices of cotton and cotton products seem to make it imperative that men personally conversant with the peculiarities of the trade should figure as controlling factors in the financing of the business.

"The average banker does not understand the trade conditions governing the textile business, and is not sufficiently interested to study them except in the most superficial way. The new bank will make a specialty of textile trade accounts."

The officers and directors of the bank are: President, John H. Bromley, Jr.; Cashier, Charles F. Kolb, Jr.; Directors, V. O. Lawrence, Wallace Wilson, William Hembery, George S. Cox, Harry Brocklehurst, John B. S. Rex, Charles F. Kolb, Jr., and John H. Bromley, Jr.

Many individuals and firms identified with the Manufacturers' Club have already signified intentions of opening accounts with the bank.

A Cheerful Manufacturer.

In these days of business pessimism it is refreshing to meet a prominent manufacturer who refuses to be blue. Mr. E. R. Miller, Secretary of the W. E. Caldwell Company, of Louisville, Ky., was encountered lately by one of our representatives and asked his views as to the present condition and future prospects of business in his line, which is the manufacture of tanks and towers for numerous purposes, including fire protection, water works for smaller municipalities, for country homes, florists and nurserymen; also tanks and tubs for distillers, brewers, tanners, laundrymen, and the like. As the business of the W. E. Caldwell Company extends all over the country and deals with so many lines of industry, it was thought that Mr. Miller would be able to give a very good idea of actual conditions. He said:

"Like everybody else, we saw the present lull in business coming. We made up our minds, however, that if by any effort on our part we could prevent a curtailment of our business, that effort would not be spared. While it is probable that the aggregate business in our line has not been so prosperous during the last six or eight months, our own has increased somewhat, and right along our new orders have been a little more numerous than those of last year, which was the most prosperous that we had had in a quarter of a century.

"To begin with, we made a much more thorough distribution of our 1904 catalogue than we had ever done with any earlier issue. We directed and shipped out in all over four carloads of catalogues. We also made a much more thorough exercise of our follow up system used in connection with our advertising in the trade papers, and of course we kept our salesmen going. The result has been very gratifying. We feel that we have had more than our share of business, although naturally very little of it has been in connection with the building of new plants. One aspect of the general reaching after economy has been decidedly beneficial to us. Many manufacturers have found, upon inquiry, that they could reduce the cost of their insurance by using an independent water supply in connection with their sprinkler systems, and these have come to us for their tank and tower outfits, the first cost of which they saved in a short time through the premium economy. As to the distribution of our business, it has naturally been especially good in the South, which has not yet felt the pinch of business curtailment. Still we are very much gratified that in all sections we have at least held our own, and in many have done better than in our banner year."

Courts Sustain the "Hemolin" Patents.

The suit of Hemolin Company against Harway Dyewood and Extract Company for infringement of patent which has been pending for four years, was decided on July 19th by Judge Coxe in the United States Circuit Court, in favor of the plaintiffs, and sustaining the "Hemolin" patents at all points. The decision, which is quoted in part on another page, shows that the court, while taking cognizance of the testimony introduced for the defence, was thoroughly impressed with the originality of the "Hemolin" patents, and also with importance of the improvements which they instituted in the manufacture of logwood extracts. The decision is of importance to the consumers of logwood no less than to the manufacturers.

Mill Soaps.

The Nicetown Manufacturing Co., Nicetown, Philadelphia, are supplying the textile trade with mill soaps specially adapted for various mill uses which we understand are giving excellent satisfaction. Their line includes white olive oil castile, green olive oil castile, fig, palm oil, red oil and brown oil soaps, cotton softeners and washing powders.

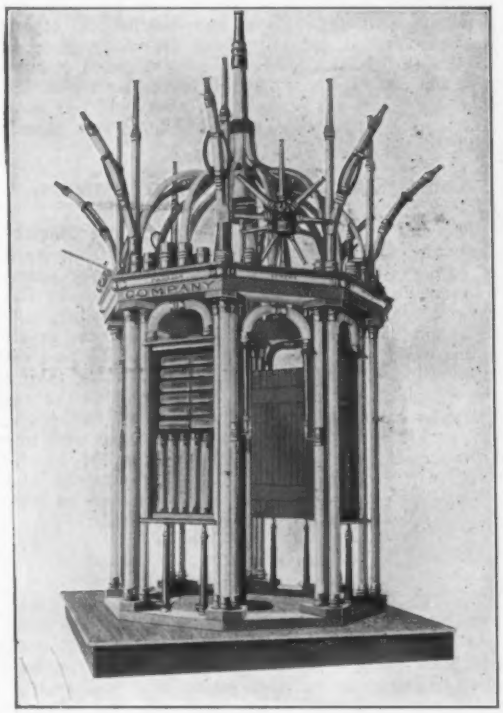
The Famous North Shore.

The beach season opens next week, and persons planning their vacation should bear in mind the North Shore. The booklet "All Along Shore," published by the Boston & Maine Passenger Department, Boston, describes and pictures the natural beauties of this famous section, from Nahant to Portland and East. It will be sent to any address upon receipt of two cents in stamps. The beautiful portfolio, containing only half tone reproductions of the best views of Marblehead, Clifton, Phillips Beach, Beach Bluff, Gloucester, Rockport, Manchester, Magnolia, Beverly, Salem, Salisbury, Rye, Hampton Beach, Kittery, York Beach, Portsmouth and Portland, will be mailed upon receipt of six cents in stamps.

The Eureka Fire Hose Co.'s Exhibit.

The St. Louis exhibit of the Eureka Fire Hose Co., 13 Barclay St., New York City, represents a large and attractively designed pagoda. It stands more than 20 feet high. Four of the eight sides are utilized for doors or entrances, in the shape of arches formed with sections of Eureka hose, while the alternate arches are occupied by cases showing samples of Eureka fire hose and other products.

The roof which is formed almost entirely of play pipes is most ingenious in its construction and shows a dome surmounted by a play pipe of large proportions.



The exhibit is built up in its various sections, of pipe couplings and other fire department material, manufactured by the Eureka Company.

The Allis-Chalmers Co.

Machinery hall, unlike the other buildings at the St. Louis World's Fair, is not closed in the evening. It is open until 11 P. M., and visitors will find at work there, among other objects of interest, the big 5,000 horse power Allis-Chalmers-Bullock engine and generator producing the electric current to keep aglow the 120,000 or more decorative lights which glitter all over the buildings and grounds.

Dyeing Aniline Black.

In our last issue an inquiry was published regarding a book treating on aniline process of dyeing hosiery. We have since learned that Messrs. Geisenheimer & Co., 189 Front St., New York, have issued a pamphlet on this subject, containing information not only about dyeing hosiery, but yarn and cloth by aniline black process. This pamphlet may be had upon application by parties specially interested.

Euboeolith Flooring.

An interesting feature of a cotton mill recently built at Landeck, Austria, is the flooring, which is made from a material called "Euboeolith," and is thus described in The Textile Mercury: It is known as the "Euboeolith" patent flooring, and is laid in one solid mass 3/8ths of an inch thick, constituting an absolutely fireproof composition. When laid, it not only forms a jointless floor, but it is non-absorbent, is not affected by atmospheric changes, and is most agreeable to walk upon. Furthermore, this kind of flooring affords a better foundation for machinery than does wood, and when fixed in position the machines run smoothly and require little subsequent adjustment. The floor, we understand, is preferably laid when all the other contractors have finished their work. We understand that Euboeolith may be laid with advantage on old wooden floors, provided only that the foundations of the latter are sound in construction.

"The American Soap & Washoline Co., 140-180 Central Ave., Cohoes, N. Y., have been notified that the contracts have been awarded to them for supplying the U. S. War and Navy departments with their well known powdered soap, 'Washoline,' for the fiscal year beginning July 1, 1904 and ending July 1, 1905, also the contract for supplying the Treasury department with bar soap for the same period."

Wool Substitutes in Australia.

An agitation—whether spontaneous or factitious we cannot say—is disturbing the Australian newspaper press, in regard to alleged fraudulent adulteration of so-called "woolen" goods. To some extent, Government aid has already been enlisted. W. Percy Wilkinson, the Government Analyst for Victoria, has been engaged in making an analytical examination of so-called "woolen" clothing fabrics, and as a result of his investigations he declares that the average amount of cotton present in the samples examined is actually 44 per cent.

In his official report Mr. Wilkinson says the inspectors of the Board of Public Health handed him portions of certain articles sold in response to demands for "woolen" clothing. Each article was marked and sealed, and the total number of samples submitted was 25. They represented socks, sweaters, under-shirts, pants, tweeds, and flannels. Preliminary examination of the threads constituting the warp and weft of the knitted yarns showed that a number of the articles did not con-

sist wholly of wool, and that cotton in part had been substituted. The percentage of cotton present was determined according to the directions issued by the German Government for use in the Customs examination of textiles. The official German method indicates a higher apparent percentage of wool than is really present, this amount being stated by Hunger to average 4 per cent. In the detailed statement of the present analysis this correction has been omitted, so that the figures reported for cotton percentage are in reality below the actual amount, probably to the extent of about 4 per cent. In each case the purity of the separated cotton was further checked by staining the isolated threads of the warp and weft, or of the separated knitted yarns, by means of an aniline dye, and verifying the absence of woolen threads by microscopical examination.

The result of the analysis was that seven of the 25 articles were found to consist entirely of wool, while 18 contained cotton in amounts varying from 5 per cent. up to 66 per cent., the average amount of cotton present being 44 per cent. Purchasers of woolens cannot protect themselves against frauds of this nature, for only a trained eye can distinguish the partial substitution.—Textile Mercury.

Dry in Arkansas.

An Arkansas subscriber in renewing his subscription says, "I have been unable to run my mill much this season on account of lack of water. This has been the driest year in Arkansas I have known in twenty-four years. There are but few wells in this place now with water enough for house use, still the crops of corn and cotton are fully as good as last year."

Recent Textile Patents.

CARDING MACHINE Feeding Mechanism. 765,490. Thomas Kershaw, Philadelphia, Pa., assignor of one-half to Richard Eckersley, Philadelphia, Pa.

CLOTH CUTTING MACHINE. 765,454. Frederick Baumann, Jr., Rutherford, N. J., assignor to Universal Cutter Co., St. Louis, Mo.

CLOTH SHEARING MACHINE. 763,385. William F. Ambach, Woonsocket, R. I.

COMBING MACHINE. Wool. 764,791. Frank G. Berwick and Samuel Hadfield, Lawrence, Mass.

COTTON CHOPPER AND CULTIVATOR. 762,714. Galveston Harwell, Cartersville, Ga.

COTTON PICKING FINGER. 762,606. John F. Appleby, Chicago, Ill.

COTTON STALK PULLING MACHINE. 762,771. Werner Swenson, Austin, Texas.

DYEING APPARATUS. 764,825. Jean Schmitt, Danjoutin-Belfort, France.

DYEING APPARATUS. 764,966. Otto Venter, Chemnitz, Germany.

DYEING COMPOSITION. 763,616. Geo. M. Lawton, Worcester, Mass.

DECORTICATING MACHINE. 761,096. John von Oven and John C. Boesch, Charleston, S. C.

DECORTICATING MACHINE. 763,170. Pierre P. Faure, Limoges, France.

FABRIC RENOVATING APPARATUS. 763,032. George Wassertheurer, Chicago, Ill.

FABRIC TREATING APPARATUS. 761,107. Manuel Muntadas y Rovira, Barcelona, Spain.

FELT CLOTH. 762,264. Pierre C. Waring, Yonkers, N. Y.

FIBRE MATERIAL SUITABLE FOR TWISTING AND SPINNING. Manufacture of Rolls of Short. 762,914. Rudolf Kron, Jr., Golzern, Germany.

FIBRES. Solution for Treating Textile. 762,834. George R. de Montlord, New York, N. Y.

FABRIC CUTTING MACHINE. 763,804. Frank A. Siebrling and Uzziel P. Smith, Akron, O.

FABRIC TENTERING and Drying Machine. 764,254. Marius Ratignier and Marius Clerc-Renaud, Lyons, France.

FIBROUS MATTER. Nitrating. 764,776. Johannes Selwig, Brunswick, Germany.

LOOM. 764,553. John C. Brooks, Paterson, N. J., assignor to Draper Co., Hopedale, Mass.

LOOM BOBBIN or Filling Carrier and Feeder. 765,088. Joseph E. Lemyre, Manchester, N. H., assignor of one-half to John H. Whitten, Manchester, N. H.

LOOM DOBBY. 763,432. Heinrich Schwarzenbach and Gottleib Lier, Zurich, Switzerland.

LOOM DOBBY LENO MOTION. 764,223. Clifford B. Arnold and Albert K. Pratt, Whitinsville, Mass., assignors to the Whitin Machine Works, Whitinsville, Mass.

LACE FABRIC. Woven. 764,208. August Ronsdorf, Amsterdam, Netherlands, assignor to Jan Herman van Eeghen and Isaak da Costa, Amsterdam, Netherlands.

LOOM FABRIC Smoothing Attachment. 765,237. Elias Goldsmith, Norfolk, Va., assignor of one-half to Otto Andrear, Jr., New York, N. Y.

LOOM FILLING CARRIER. Automatic Feeler. 764,606. Cincinatus H. Land, Knoxville, Tenn., assignor to Draper Co., Hopedale, Mass.

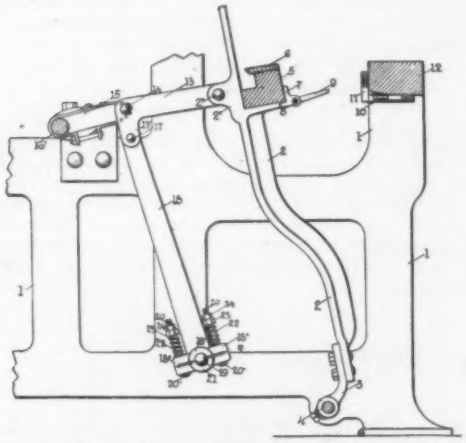
LOOM FILLING REPLENISHING. 763,411. Wallace I. Stimpson, Milford, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM. Hand. 763,828. Seth H. Woodbury, Lynn, Mass.

LOOM HARNESS MECHANISM. 763,418. Charles E. Nutting, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM SHUTTLE BOX MOTION. 764,888. Albert A. Gordon, Jr., Worcester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

LOOMS. Lay Motion for. 763,088. Arthur S. Cowan, Worcester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass.



The object of my invention is to provide an improved yielding connection intermediate to the crank-shaft which operates the lay and the lay-sword, so that when the lay protects to stop the loom, the continued movement of the crank-shaft, which is not immediately stopped, will move the yielding connection and not force forward and possibly break the lay-sword.

LOOM FOR SCHOOLS. 764,479. Beatrice E. Lindberg, Faribault, Minn.

LOOM SHUTTLE FILLING CARRIER. 764,214. Wallace I. Stimpson, Milford, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM STOP MOTION. 763,556. James M. Grey, Burnley, England.

LOOM TAKE UP MECHANISM. 764,771. Edward D. Roy, Anderson, S. C., assignor to Draper Co., Hopedale, Mass.

LOOM TEMPLE. 763,462. James F. Carberry, Worcester, Mass.

LOOM TEMPLE. 763,619. Peter Macpherson, Worcester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

LOOM WARP PULLER. 763,628. Anker Petersen, Boston, Mass.

LOOM WARP STOP MOTION. 764,899. Albert K. Pratt, Whitinsville, Mass., assignor to Whitin Machine Works, Whitinsville, Mass.

LOOM WARP STOP MOTION. 765,495. Paul V. Laboute and Israel Guertin, Manchester, N. H.

LOOM WEFT REPLENISHING. 765,453. William H. Baker, Central Falls, R. I.

LOOM WEFT REPLENISHING. 764,326. Horace Wyman, Worcester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

LOOM FOR WEAVING Slat Blinds. 764,290. Azel C. Hough, South Butler, N. Y.

MERCERIZING APPARATUS. 765,398. Isaac E. Palmer, Middletown, Conn.

SPINDLE LUBRICATOR. 764,786. Joseph Voyer, Woonsocket, R. I.

LOOM. Automatic Filling Replenishing. 761,629. George O. Draper, Hopedale, Mass., assignor Draper Co., Hopedale, Mass.

LOOM. Automatic Filling Replenishing. 761,724. Melvin L. Stone, Lowell, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM FILLING CARRIER. Feeler. 760,627. Oscar E. Holdridge, New Bedford, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM FILLING DETECTING MEANS. 763,015. Jonas Northrop, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM FILLING END HOLDER. Automatic. 762,023. Larkin H. Brown, Knoxville, Tenn. assignor to Draper Co., Hopedale, Mass.

LOOM FILLING REPLENISHING. 760,769. Everett S. Wood, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM. Hammock. 762,493. Harriet E. Ruddy, St. Paul, Minn., assignor to Martha P. Todd and Dana Todd, Minneapolis, Minn.

LOOM HEDDLES. Separating Means for Metallic. 761,677. Charles S. Howard, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM LAY MOTION. 763,088. Arthur S. Cowan, Worcester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

LOOM LUG STRAP HOLDER. 760,972. William Donner, Dubuque, Iowa, assignor to Draper Co., Hopedale, Mass.

LOOM FOR THE MANUFACTURE OF ORIENTAL CARPETS. 763,250. Fernand Boyer, Paris, France and Georg Baum, Rorschach, Switzerland.

LOOM. Narrow Ware. 763,247. Frederick Benz, Jr., Haledon, N. J.

LOOM PICKER. 761,622. Benjamin L. Bailey, Danielson, Conn., assignor of one-half to Luther Pilling, Danielson, Conn.

LOOM PICKER CHECK. 760,994. Robert Jamieson, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM PILE WIRE. 763,181. Harry Hardwick, Philadelphia, Pa., assignor to Ivins, Dietz & Metzger Co., Philadelphia, Pa.

LOOM PILE WIRE SHARPENER. 761,052. William Tunstall, Philadelphia, Pa., assignor to Ivins, Dietz & Metzger Co., Philadelphia, Pa.

LOOM SHUTTLE. 762,905. Alfred Isherwood, New Bedford, Mass.

LOOM SHUTTLE BOX. 761,617. Albert E. Arthur and George Walker, Norwood Green, England.

LOOM SHUTTLE CHECKING MEANS. 761,999. Walter F. Roper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM SHUTTLE CHECKING MEANS. 763,122. Isaac Snow, Lawrence, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM SHEDDING MECHANISM. 763,086. Frank S. Berry, Northbridge, Mass.

C. E. RILEY & CO.

65 Franklin Street, BOSTON, MASS.

BUILDERS AND IMPORTERS OF

COTTON WOOLEN WORSTED

MACHINERY

AGENTS FOR

HOWARD & BULLOUGH, Ltd., Picking, Revolving Flat Cards, Electric and Mechanical Stop Motion Drawing, Slubbing, Intermediate, Roving and Jack Frames, Spinning and Twisting, New Patent Self-Acting Mules, Spoolers, Warpers and Slashers,

RICHARD THRELFALL, Patent Fine Spinning Mules, 100s to 350s.

HALL & STELLS, Worsted Machinery.

CONSTRUCTION DE MACHINES, Ci-Devant, F. J. Grun. French Worsted Machinery.

HOYLE & PRESTON, Noble Combs, Back Washing Machines, etc.

JAMES TOMLINSON, Ltd., Cotton Waste Machinery; Engine Cleaning and Hard Waste Breaking Machines, etc.

JOHN HAIGH & SONS, Ltd., Woolen and Worsted Cards, Fearnoughts, Feeds, etc,

THOS. BROADBENT & SONS, Hydro Extractors, Patent Suspended Steam and Electrical Driven, Machines kept in stock in Boston.

JOHN WHITELEY & SONS, Card Clothing for Cotton; Tempered Steel, Plough Ground, Needle Pointed.

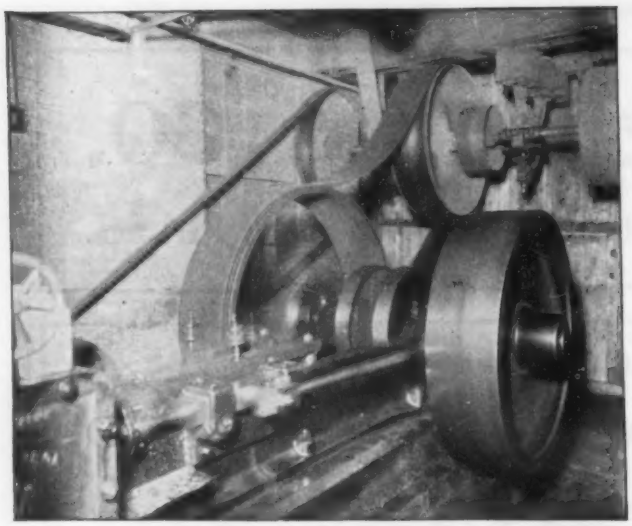
L. M. TETLOW & SONS, Card Clothing for Woolen and Worsted; Tempered Steel, Needle Pointed.

J. GREENHALGH & SONS, Cotton Waste Willows, for Fly, Strips, Picker Droppings, etc.

DRONSFIELD BROS., Ltd., Grinding Rolls and Emery Filleting. Stock kept in Boston.

SPINDLES, FLYERS, FLUTED ROLLS, ETC.

DIRECT .. .. IMPORTERS OF **EGYPTIAN COTTON**



SHORT CENTERS.

PENINSULAR TOOL MFG CO

DETROIT MICH Jan 21 1904

CLING-SURFACE CO Buffalo N Y

Gentlemen:—Herewith find photograph of our main belt which we consider a good example of the new method of running belts with Cling-Surface which live manufacturers are taking advantage of.

It is of special interest because of the belt's being able to carry full load on such short centers and yet run slack, without slipping.

The engine is 35 H. P., 180 R. P. M. The belt is double leather, 10" face, 8' centers. Main pulley 4' 6" and driven pulley 4'. There is 15" slack in the belt.

We have used Cling-Surface in this belt since January 5, 1903, and today it is pliable, in the best condition, and not sticky, but with a surface clean—looking and feeling like black velvet.

We never have to take it up and it does its work daily, overloads or underloads, with no complaint or nursing.

PENINSULAR TOOL MFG CO

H W BULL Sec'y and Treas

This belt shows how absolutely Cling-Surface stops belt slipping and without any adhesion. Note how steady it is. Power delivered as positively and evenly as a direct connection.

You have looked for Cling-Surface for many years. Now it is ready for a trial and satisfaction or money back. Anywhere, any time. Order for trial.

Cling-Surface Co 199-205 Virginia St Buffalo N Y

NEW YORK BOSTON PHILADELPHIA

LUNKENHEIMER

A WELL designed, compact, durable, efficient, low-priced Injector for all classes of boilers. Competitive tests show the Lunkenheimer superior to any other similar machine on the market. Made of bronze in standard sizes. If you want an all-around satisfactory boiler feeder, always dependable, specify "*Lunkenheimer*" and order from your dealer. Write for catalog.

THE LUNKENHEIMER COMPANY

Largest Manufacturers of Engineering Specialties in the World,

CINCINNATI, OHIO. Branches { New York, 26 Cortlandt St. London, 35 Great Dover St.

AUTOMATIC INJECTOR

Buyers' Index.

The addresses of builders of mill machinery and dealers in mill supplies, whose names appear in the following classified index, may be found upon referring to their advertisement. The Alphabetical Index to advertisers follows this classified list. Buyers who are unable to find in these classified lists such machinery or supplies as they desire, are invited to communicate with the publishers, who can, in all probability, refer them to proper sources.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Accident Cabinets.
Putnam & Co.

Air Moistening System.
American Moistening Co.
Bell Pure Air & Cooling Co.

Appraisals.
Audit & Appraisement Co. of America, The.

Architects and Mill Engineers.
Ballinger & Perrott.
Dean & Main.
Ferguson, John W.
Stearns & Castor.
Suck, Adolph.

Asphalt and Concrete.
Warren Bros. Co.

Automatic Feeds for Cotton and Wool.
American Drying Machinery Co.
Harwood, Geo. S. & Son.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Schofield, Wm. Co.
Smith, Jas., Woolen Machinery Co.
Woonsocket Machine & Press Co.

Automatic Shuttle and Loom Attachments.
Asaia Co.

Baling Machine.
North Chelmsford Machine Co.
Torrance Mfg. Co.

Bandings.
——See under Yarns.

Baskets.
Lane, W. T. & Bro.
Morris & Co.

Belting.
Houghton, E. F., Co.
Jeffrey Manufacturing Co.
Main Belting Co.
Shultz Belting Co.
Smith, Jas., Woolen Mach. Co.
——See also Mill Supplies.

Belt Dressing.
Cling Surface Mfg. Co.
Dixon, Jas., Crucible Co.
Houghton, E. F., Co.
Stephenson Mfg. Co.

Belt Lacing Machines.
Diamond Drill & Machinery Co.

Bindings.
——See Tapes and Braids.

Bleaching Kiers.
Arlington Mch. Wks. (Arthur Birch, prop.)
Textile Finishing Machinery Co.

Bleaching Materials.
Besson & Lane.
Roessler & Hasslacher Chemical Co.

Blowers and Blower Systems.
American Blower Co.
Barney Ventilating Fan Works.
Boston Blower Co.
Buffalo Forge Co.
Mass. Fan Co.
Parsons Mfg. Co.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.
Schnitzler, Chas. H.

Bobbin Covers.
Kolb, Frank E.

Bobbins, Spools, Shuttles, Etc.
Leigh, Evan A.
Tebbets, E. L. & Co.

Boilers.
——See Steam Boilers.

Boiler Arches, "Steel Mixture."
McLeod & Henry.

Boiler Furnace Equipment.
Parsons Mfg. Co.

Boiler Setting.
Harris, J. B.

Boxes, Cloth Boards, Etc.
Pearson, J. T.

Boxes (Paper).
——See Paper Boxes.

Braiding Machinery.
New England Butt Co.
Textile Machine Works.

Braids.
——See Tapes, Braids and Edgings.

Brass (Perforated).
——See under Perforated Metal.

Brooms.
Philadelphia Broom Co.

Brushes.
Felton, S. A. & Son Co.
Mason Brush Works.

Brushers.
——See Napping Machines.

Burr Pickers.
Curtis & Marble Machine Co.
Sargent's, C. G., Sons.
Smith, Jas., Woolen Machinery Co.

Burlaps.
Stoddard, Haserick, Richards & Co.

Calico Printers' Machinery and Supplies.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W. & Sons Co.
Taunton, New Bedford, Copper Co.
Textile Finishing Mchry. Co.
——See also Dyeing, Bleaching, Machinery, etc.

Canvas Baskets.
Lane, W. T. & Bro.
Morris & Co.

Carbonizing.
Riverdale Woolen Co.

Carbonizing Machinery.
American Drying Machinery Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Smith, Jas., Woolen Machinery Co.

Card Clothing.
Ashworth, Elijah.
Leigh, Evan A.
Riley, C. E. & Co.
Smith, Jas., Woolen Machinery Co.
Stoddard, Haserick, Richards & Co.

Card Feeds.
——See Automatic Feeds.

Card Grinding Machinery.
Entwistle, T. C., Co.
Leigh, Evan A.
Philadelphia Textile Machinery Co.
Riley, C. E. & Co.
Smith, Jas., Woolen Machinery Co.
Stoddard, Haserick, Richards & Co.

Carders' Tools.
Brown, W. H.

Carpet Machinery.
Altemus, Jacob K.
Curtis & Marble Machine Co.
Howard Foundry & Mch. Wks.
Philadelphia Textile Machinery Co.
Smith, Jas., Woolen Machinery Co.

Castings.
Schofield, Wm., Co.

Chemicals.
Fiedt, Geo. D. & Co.
Grasselli Chemical Co.
Roessler & Hasslacher Chemical Co.
Solvay Process Co.

Chemists.
Little & Walker.

Cling Surface.
Cling Surface Mfg. Co.

Clocks.
Pettes & Randall Co.
Riggs & Brothers.

Cloth Boards.
Chaffee Bros.
Pearson, J. T.
Shryock, J. K.

Cloth Extractors.
Eaton, Wyman.

Cloth Stretchers.
Arlington Mch. Wks. (Arthur Birch, prop.)
Eaton, Wyman.
Textile Finishing Machinery Co.

Clutches.
American Tool & Machine Co.
Hunter, James, Machine Co.
Reeves Pulley Co.
Smith, Jas., Woolen Machinery Co.

Combs (Wool and Cotton).
Hood, R. H.
Leigh, Evan A.
Philadelphia Textile Machinery Co.
Riley, C. E. & Co.
Smith, Jas., Woolen Machinery Co.
Stoddard, Haserick, Richards & Co.
Townsend, Thomas.

Combustion System.
Harris, J. B.

Conveyors, Pneumatic.
——See Blowers & Blower Systems.

Conveying Machinery and Chains.
Jeffrey Manufacturing Co.

Cop Tubes.
——See Paper Tubes.

Copper (Perforated).
——See under Perforated Metal.

Copper Print Rollers.
Taunton, New Bedford Copper Co.

Coppersmiths.
Beer, Paul.
Badger, E. B. & Sons Co.

Copper Work for Dyers.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

Cotton.
Blaisdell, S., Jr., Co.
Charles, W. B.
Riley, C. E. & Co.
Stoddard, Haserick, Richards Co.

Cotton Elevators.
Buffalo Forge Co.

Cotton Machinery.
Altemus, Jacob K.
Atherton, A. T., Machine Co.
American Drying Machinery Co.
Ashworth, Elijah.
Barker, James.
Butterworth, H. W. & Sons Co.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Cohoes Foundry & Machine Co.

Alphabetical Advertising Index, with page numbers, follows this list.

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Elliott & Hall.
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Firth, William, Co.
Houghton, L. T.
Howard & Bullough American Mach. Co.
Kilburn, Lincoln & Co.
Kitson Machine Co.
Leigh, Evan A.
Lowe, Stephen C.
Lowell Machine Shop.
Mason Machine Works.
Metallic Drawing Roll Co., The.
North Chelmsford Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Rheinhauer, D. & Co.
Riley, C. E. & Co.
Saco & Pettee Machine Shops.
Schaellibaum, Robert, Company.
Schofield, Geo. L.
Smith, Jas., Woolen Machinery Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Vacuum Dyeing Machine Co.
Whitin Machine Works.
Woonsocket Machine & Press Co.

Cotton Openers and Lappers.
Atherton, A. T., Machine Co.
Howard & Bullough American Mach. Co.
Kitson Machine Co.
Leigh, Evan A.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

Cotton Softeners.
Bosson & Lane.

Cotton Waste.
Becker, C. W.
Blaisdell, S., Jr., Co.
Charles, W. B.

Crayons.
Dixon, Jos., Crucible Co.
Lowell Crayon Co.

Cutters for Knit Fabrics.
Kennedy, Thos. (Cutters, etc.).

Dating and Time Stamps.
Riggs & Brothers.

Dextrine.
Stein, Hirsh & Co.

Dobbies.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.

Drawing Rolls.
Hood, R. H.
Metallic Drawing Roll Co., The.

Dryers.
American Blower Co.
American Drying Machinery Co.
Arlington Mch. Wks (Arthur Birch, prop.)
Birch, Arthur, Arlington Machine Works.
Boston Blower Co.
Buffalo Forge Co.
Butterworth, H. W. & Sons Co.
Eaton, Wyman.
Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.
Mass. Fan Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Smith, Jas., Woolen Machinery Co.
Sturtevant, B. F., Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.
Whittle, Jas. H.

Drying Boards.
Bull, William C.
Pearson, J. T.

Dusters.
——See Wool and Waste Dusters.

Dust Collectors.
Allington & Curtis Mfg. Co.
Hartford Blower Co.
Philadelphia Drying Machinery Co.

Dyers, Bleachers and Finishers.
Blissville Mills.
Brophy's, T., Sons.
Cranston Worsted Mills (yarns).
Davidson, J. F.
Drexler, W. M. & Co.
Firth & Foster Co.
Greenwood, R. & Bault.
Home Bleach & Dye Works.
Ingrahamville Dye Works.
Keystone Fast Black Dye Works.
Lorimer's, The Wm. H. & Sons Co.
Maryland Bleach & Dye Works.
Molt Bros. (Indigo Blue).
Pawtucket Dyeing & Bleaching Co.
Providence Mills Mfg. Co.
Rowland, Samuel.
Vacuum Dyeing Machine Co.

Dyeing, Drying, Bleaching and Finishing Machinery.
American Blower Co.
American Drying Machinery Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Machine Works.
Buffalo Forge Co.
Butterworth, H. W. & Sons Co.
Curtis & Marble Machine Co.
Dubois, A. N.
Eaton, Wyman.
Entwistle, T. C., Co.
Fabric Measuring & Packaging Co.
Gessner, David.
Heathcote, John & Son.
Hopkins Machine Works.
Howard Foundry & Mch. Wks.
Kenyon, D. R. & Son.
Klauder-Weldon Dyeing Machine Co.
Leigh, Evan A.
Leyland, Thos. & Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Smith, Drum & Co.
Smith, Jas., Woolen Machinery Co.
Sturtevant, B. F., Co. (Drying).
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.
Whittle, Jas. H.
Wing, L. J., Mfg. Co.

Dye House Cans.
Hill, James, Mfg. Co.

Dye Sticks.
Bailey, Frank.
Haedrich, E. M.

Dyestuffs and Chemicals.
American Dyewood Co.
Atteaux, F. E. & Co.
Berlin Aniline Works.
Bischoff & Co.
Bosson & Lane.
Cassella Color Co.
Dillon & Co.
Dubois, A. N.
Grasselli Chemical Co.
Kalle & Co.
Farbenfabriken of Elberfeld Co.
Ford, J. B., Co.
Fortner, L. B.
Geigy Aniline & Extract Co.
Geisenheimer & Co.
Holliday & Sons, Ltd.
Johnson, Chas. A. & Co.
Kuttroff, Pickhardt & Co.
Leyland, Thos. & Co.
Metz, H. A. & Co.
Molt Bros. (Indigo Blue).
Roessler & Hasslacher Chemical Co.
Schoen & Schlichter.
Selling Co., The.
Solvay Process Co.
Sykes & Street.
Thayer, Ed. M.
Vila, H. S.

Dynamos and Motors.
Allis Chalmers Company.
General Electric Co.
Mechanical Appliance Co.
Sturtevant, B. F., Co.

Edgings.
——See Tapes, Braids and Edgings.

Electrical Construction.
Allis Chalmers Company.
General Electric Co.
Mechanical Appliance Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Fans.
American Blower Co.
Buffalo Forge Co.
General Electric Co.
Hartford Blower Co.
Mass. Fan Co.
Mechanical Appliance Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Lamps.
Sturtevant, B. F., Company.

Electric Lighting.
Allis Chalmers Company.
General Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Motors.
Allis Chalmers Company.
General Electric Co.
Mechanical Appliance Co.
Sturtevant, B. F., Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Elevators.
Cohoes Foundry & Machine Co.
Howard Foundry & Mch. Wks.
Jeffrey Manufacturing Co.
Morse, Williams & Co.
Salem Elevator Works.

Embroidering Machine.
Ahlstrom, O. J.

Employees' Time Recorders.
Pettes & Randall Co.
Riggs & Brothers.

Exhaust Heads.
Burt Manufacturing Co.
Pittsburgh Gage & Supply Co.
Sturtevant, B. F., Co.

Fans—Exhaust and Ventilating.
——See Ventilating Apparatus.

Feed Water Heaters.
Green Fuel Economizer Co.
Roberts Filter Co.
Scaife, W. B. & Sons.

Feed Water Pumps.
Goulds Mfg. Co.
Pittsburgh Gage & Supply Co.
Scaife, W. B. & Sons.

Feed Water Purifiers.
Philadelphia Water Purification Co.

Feeds.
——See Automatic Feeds.

Filters.
Norwood Engineering Co.
Phila. Water Purification Co., The.
Pittsburgh Gage & Supply Co.
Roberts Filter Co.
Scaife, W. B. & Sons.

Finishing Machinery.
——See Dyeing, Drying, Bleaching and Finishing.

Fire Box Blocks, "Steel Mixture."
McLeod & Henry Co.

Fire Brick.
Borgner, Cyrus, Co.
McLeod & Henry.

Fire Extinguishers.
Badger, E. B. & Sons Co.

Fire Hose.
Eureka Fire Hose Co.

Fire Hydrants.
Norwood Engineering Co.

Fire Proof Doors and Windows.
Lupton's, David, Sons Co.

Flax, Tow, Hemp and Jute Machinery.
Haskell-Dawes Mach. Co.
Lawson, Samuel & Sons.
Leigh, Evan A.

Fluted Rolls.
Hood, R. H.
Leigh, Evan A
Riley, C. E. & Co.
Thurston, A. G. & Son.

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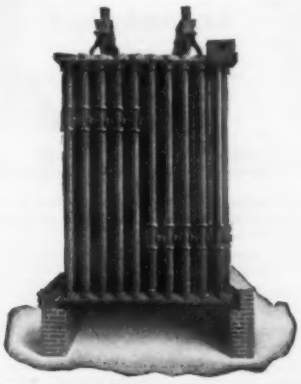
ECONOMIZE

IN YOUR BOILER PLANT

INSTALL A

Sturtevant Economizer



Boiler capacity increased 20 to 40%. Patent system of "staggered pipes" gives increased saving over straight pipe economizers. For high or low pressures. No leaky joints. Easily accessible. . . . .

Send for catlogue.

B. F. STURTEVANT CO.

BOSTON, MASS.

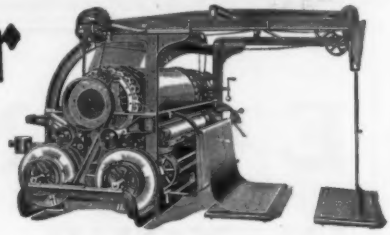
General Office and Works, Hyde Park, Mass.

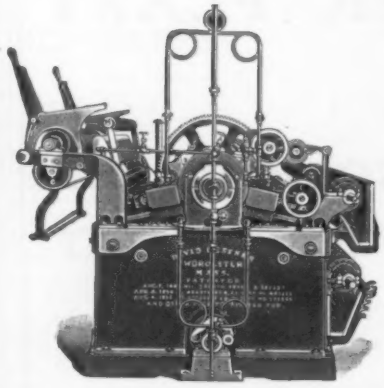
NEW YORK PHILADELPHIA CHICAGO LONDON

387

David Gessner

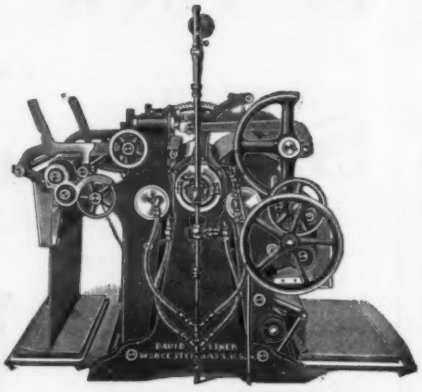
Worcester, Mass.





Latest Improved Cloth Finishing Machinery

Napping Machines and Presses a Specialty



Flyers.
Leigh, Evan A.
Textile Machinery Co.

Forges.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Forwarders.
McKeon, John F.

Friction Clutches.
——See Clutches.

Friction Cones.
Evans, G. Frank.

Fuel Economizers.
Green Fuel Economizer Co.
Parson Mfg. Co.

Furnace for Boilers.
Harris, J. B.
Parson Mfg. Co.

Fulling Mills for Woolen Goods.
Hopkins Machine Works.
Hunt, Rodney, Machine Co.
Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.

Garnetts.
Leigh, Evan A.
Philadelphia Textile Machinery Co.
Smith, Jas., Woolen Machinery Co.

Gas Engines.
Jones, Lewis.

Gas Exhausters.
Sturtevant, B. F., Co.

Gauges.
Crosby Steam Gage & Valve Co.
Lunkenheimer Co.
Pittsburgh Gage & Supply Co.
Walworth Manufacturing Co.

Gears.
New Process Raw Hide Co.

Gear Cutting Machine.
Whiton, The D. E., Co.

Generating Sets.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Grate Bars.
Parsons Mfg. Co.

Grids for Cotton Openers.
Schaellibaum, Robert, Company.

Heating.
——See Ventilating.

Heddles.
Smith, Jas., Woolen Machinery Co.
Stoddard, Haserick, Richards & Co.

Hosiery Boards.
Pearson, J. T.

Hosiery Printer.
Bray, John.

Hoists and Hoisting Machinery.
Larrabee, John E.

Humidifying Apparatus.
American Air Moistening Co.

Hydro Extractors.
American Tool & Machine Co.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.
Whittle, Jas. H.

Injectors.
Lunkenheimer Co.

Ironing Machines for Knit Goods.
Craw, J. W., Laundry Machinery Co.

Jacquards.
Halton's, Thomas, Sons.

Knit Goods, Edgings, Trimmings, Etc.
Cathcart, John & Co.
Chapin, Geo. W.
Charles, W. B.
Cheney Bros.
Friedberger Mfg. Co.
Hepner & Horwitz.
Krout & Fite Mfg. Co.
Weimar Bros.

Knit Goods, Finishing Machines, Crochet, Etc.
Craw, J. W., Laundry Machinery Co.
Merrow Machine Co., The.
Nye & Tredick Co.
Scott & Williams.
Union Special Machine Co.
Willcox & Gibbs Sewing Machine Co.

Knitting Machine Cylinders.
Paxton & O'Neill.
Ruth Automatic Knitting Machine Co.
Stafford & Holt.
Stanton & Lewis.

Knitting Machinery.
American Knitting Machine Co.
Branson Machine Co.
Brinton, H. & Co.
Claes & Flentje.
Cooper, Chas.
Crane Mfg. Co.
Excelsior Knitting Machine Mfg. Co.
Irmscher & Co.
Jenckes, E., Mfg. Co.
Jones, Lewis.
Kennedy, Thos. (Cutters, etc.).
Keystone Knitting Machine Mfg. Co.
Lamb Knitting Mach. Mfg. Co.
Leighton Machine Co.
Lindley, Geo. W.
Mayo, Geo. D., Knitting Machine Co.
Mayo Knitting Machine & Needle Co.
McMichael, A.
McMichael & Wildman Mfg. Co.
Mueller, Arthur.
Muller, Julius.
National Automatic Knitter Co.
Newton, E. A.
Nye & Tredick Co.
Paxton & O'Neill.
Pepper Machine Works.
Quaker City Stop Motion Co.
Rheinauer, D., & Co.
Richter, Wolfgang.
Schoebel, Walter.

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The New

Crompton-Thayer Loom Company

.. MANUFACTURERS OF ..

FANCY LOOMS

For Weaving Worsted and Woolen, Fancy Cottons and Silk Fabrics.

Dobbies, Box Motions and Supplies.

WORKS AND OFFICES:

677 Cambridge Street, Worcester, Mass.

Knitting Machinery—cont.
Scott & Williams.
Seyfert & Donner.
Stafford & Holt.
Standard Machine Co.
Taylor, James.
Tompkins Bros.
Walther, Otto.

Knitting Needles and Supplies.
Breedon's, Wm., Son.
Brinton, H. & Co.
Cooper, Chas.
Corey, Wm., Co.
Crane Mfg. Co.
Dodge Needle Co.
Freeman Bros.
Ives, Loyal T.
Keystone Knitting Machine Mfg. Co.
Kolb, Frank E.
Lamb Knitting Machine Mfg. Co.
Manufacturers' Supplies Co.
Mayo Knitting Machine & Needle Co.
Page Needle Co.
Rheinhauer, D. & Co.
Treat, Orion.
Wardwell Needle Co.

Labeling Machines.
Beck, Chas., Paper Co., Ltd.

Laboratory Outfits.
Feldt, Geo. D. & Co.

Leather.
Houghton, E. F., Co.

Leveling Apparatus for Shafting.
Eaton, Wyman.

Loom Pickers.
Garland Mfg. Co.

Looms.
Asala Co.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Draper Company.
Howard Fndy. & Mch. Wks. (For Wire).
Kilburn, Lincoln & Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Smith, Jas., Woolen Machinery Co.
Stoddard, Haserick, Richards & Co.
Whitin Machine Works.

Loopers.
Hepworth, John W. & Co.
Leighton Machine Co.

Lubricators.
Borne, Scrymser Co.
Dixon, Jos., Crucible Co.
Lunkenheimer Co.
Pittsburgh Gage & Supply Co.

Lumpers.
Gerry, George & Son.
Schofield, Wm. Co.

Machinery Dealers.
Jefferson, Ed. & Bro.
Lamb, J. K., Textile Mach. Co.
Pittsburgh Gage & Supply Co.
Schofield, Geo. L.
Taylor, James.

Machinists' Tools.
Curtis & Marble Machine Co.
Whiton, The D. E. Co.

Mails.
Walder, J.

Measuring and Folding Machines.
Elliott & Hall.
Fabric Measuring & Packaging Co.

Mechanical Draft.
American Blower Co.
Boston Blower Co.
Buffalo Forge Co.
Massachusetts Fan Co.
Sturtevant, B. F., Co.

Mechanical Engineers.
American Blower Co.
Buffalo Forge Co.
Dean & Main.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.
Suck, Adolph.

Mercerizers.
Blissville Mills.
Greenwood & Bault, R.
Home Bleach & Dye Works.
Lorrimer, Wm. H., Sons Co.
Maryland Bleach & Dye Works.

Mercerizing Machinery.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., & Sons.
Klauder-Weldon Dyeing Machine Co.
Niederlahnsteiner Maschinenfabrik.
Smith, Drum & Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.

Mill Architects.
——See Architects and Mill Engineers.

Mill Brushes.
——See Brushes.

Mill Builders and Engineers.
Ferguson, John W.

Mill Sewing Machines.
——See Sewing Machines and Supplies.

Mill Supplies.
American Supply Co.
Bamford & Smith.
Barker, James.
Buckley's, Benj., Son., Gun Mill.
Crosby Steam Gage and Valve Co.
Dixon Lubricating Saddle Co.
Easton-Burnham Co.
Eureka Fire Hose Co.
Garland Mfg. Co.
Houghton, E. F., Co.
Jefferson, Ed., & Bro.
Jeffrey Manufacturing Co.

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Kolb, Frank E.
Lane, W. T., & Bro.
Larrabee, John E.
Leigh, Evan A.
Main Belting Co.
Morris & Co.
Murphy, E. W., & Co.
Philadelphia Drying Machinery Co.
Philadelphia Broom Co.
Pittsburgh Gage & Supply Co.
Putnam & Co.
Rheinhauer, D. & Co.
Riley, C. E., & Co.
Richardson Bros.
Shaw, Victor, Ring Traveler Co.
Smith, Jas., Woolen Machinery Co.
Stephenson Mfg. Co.
Stoddard, Haserick, Richards & Co.
Thurston, A. G., & Son.
Tucker, W. W. & C. F.
Ward & Vandegrift.
Walworth Manufacturing Co.

Mill Trucks.
Towsley, John T., Mfg. Co.

Motors.
——See Electric Motors.

Napping Machinery.
American Napping Machine Co.
Borchers, Richard C., & Co.
Curtis & Marble Machine Co.
Gessner, David.
Jones, Lewis.
Leigh, Evan A.
Parks & Woolson Machinery Co.
Whiteley, William, & Sons, Ltd.

Noils (Silk).
Malcolm Mills Co.
Ryle, Wm., & Co.

Numbering Machines.
Force, Wm. A., & Co.

Oil Cups.
Lunkenheimer Co.
Pittsburgh Gage & Supply Co.
Walworth Manufacturing Co.

Oil Filters.
Burt Manufacturing Co.
Pittsburgh Gage & Supply Co.

Oils.
Borne, Scrymser Co.
Murphy, E. W., & Co.
New York & New Jersey Lubricant Co.
Schoen & Schlichter.
Stephenson Mfg. Co.

Oil Hole Covers.
Tucker, W. W. & C. F.

Overhead Tracks.
Cohoes Foundry & Machine Co.
Putnam & Co.

Overseaming Machines.
Merrow Machine Co.
Willcox & Gibbs Sewing Machine Co.

Oxidizing Machinery.
Dubois, A. N.

Paint.
Standard Paint Co.

Pantagraphs for Mill Engraving.
Johnson, C. A., & Co.

Paper.
Richardson Bros.

Paper Boards.
Shryock, J. K.

Paper Box Machinery.
Beck, Chas., Paper Co., Ltd.

Patent Solicitors.
Crosby & Gregory.
Howson & Howson.
Siggers & Siggers.

Perforated Metals.
Allis-Chalmers Co.
Beckley, A. J., & Co.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co.

Pipes and Fittings.
Pancoast, Henry B., & Co.
Walworth Manufacturing Co.

Pneumatic Conveying.
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Power Transmission Machinery.
Allis-Chalmers Co.
American Drying Machinery Co.
American Mfg. Co.
American Pulley Co.
Cohoes Foundry & Machine Co.
Columbian Rope Co.
Evans, G. Frank.
Howard Foundry & Machine Works.
Hunter, Jas., Machine Co.
Jeffrey Manufacturing Co.
Kilburn, Lincoln & Co.
Houghton, E. F., Co.
Pittsburgh Gage & Supply Co.
Philadelphia Drying Machinery Co.
Reeves Pulley Co.
Saginaw Manufacturing Co.
Schofield, Wm., Co.
Sellers, William, & Co.
Smith, Jas., Woolen Machinery Co.
Standard Pressed Steel Co.
Textile Finishing Machinery Co.

Preparatory Machinery (Cotton).
Atherton, A. T., Mach. Co.
Howard & Bullough Am. Machine Co.
Kitson Machine Co.
Leigh, Evan A.
Riley, C. E., & Co.
Saco & Pettee Machine Shops.
Smith, Jas., Woolen Machinery Co.

Presses.
Boomer & Boschert Press Co.
Butterworth, H. W., & Sons Co.
Curtis & Marble Machine Co.
Gessner, David.
Hart, Charles.
Howard Foundry & Mch. Wks.
Miller Press & Machine Co.
North Chelmsford Machine Co.
Spence & Rideout.
Textile Finishing Machinery Co.
Woonsocket Machine & Press Co.

Pressure Regulators.
Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

Pulleys.
——See Power Transmitting Machinery.

Pumps.
Allis-Chalmers Co.
Goulds Mfg. Co.
Textile Finishing Machinery Co.

Pump Governors.
Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

Purifying & Filtration Plants.
Norwood Engineering Co.
Philadelphia Water Purification Co.
Roberts Filter Co.
Scaife, W. B., & Sons.

Quillers.
Foster Machine Co.
North Chelmsford Machine Co.
Payne, G. W., & Co.

Rag Pickers.
Philadelphia Textile Machinery Co.
Schofield, Wm., Co.
Smith, Jas., Woolen Machinery Co.

Ramie Tops and Noils.
Tierney, Frank A.

Raw Hide Gears.
New Process Raw Hide Co.

Reed and Harness Manufacturers.
American Supply Co.
Garland Mfg. Co.
Walder, J.

Reels.
North Chelmsford Machine Co.

Reducing Valves.
Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

Regulators (Pressure).
Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

Remnants.
Feingold, H. & D.

Ribbons.
Barton, F. C.
Cheney Bros.

Ring Travelers.
Shaw, Victor, Ring Traveler Co.

Roller Leather.
Houghton, E. F., Co.

Roofing.
Standard Paint Co.

Rope.
American Mfg. Co.
Columbian Rope Co.

Rope Transmission.
American Mfg. Co.
Columbian Rope Co.

Rope and Twine Machinery.
Haskell-Dawes Machine Co., The.

Roving Cans.
American Vulcanized Fibre Co.
Hill, James, Mfg. Co.
Laminar Fibre Co.

Ruberoid Roofing.
Standard Paint Co.

Safes.
Sears, Roebuck & Co.

Saddles and Stirrups.
Dixon Lubricating Saddle Co.

Scallop Machines.
Merrow Machine Co.

Schools.
Bradford-Durfee Textile School.
Lowell Textile School.
New Bedford Textile School.
Philadelphia Textile School.

Secondhand Machinery.
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Screens (Perforated).
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——See Commission Merchants.
——See Commission Merchants.

Separators.
Draper Co., The.

Sewing Machines and Supplies.
Arlington Mch. Wks. (Arthur Birch, prop.)
Curtis & Marble Machine Co.
Dinsmore Mfg. Co.
Fales, L. F.
Manufacturers' Supplies Co.
Metropolitan Sewing Machine Co.
Textile Finishing Machinery Co.
Union Special Machine Co.
Willcox & Gibbs Sewing Machine Co.

Shafting, Hangers, Etc.
——See Power Transmission Machinery.

Shearing Machinery.
——See Dyeing, Drying, Bleaching and Finishing.

Sheet Metal Work.
Barney Ventilating Fan Works.
Lupton's, David, Sons Co.

Shell Rolls.
Thurston, A. G., & Son.

Shoddies.
——See Wool Shoddies.

Shuttles.
——See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., Sons Co.
Leigh, Evan A.
Mason Machine Works.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.

Silk Mill Supplies.
Hall, I. A., & Co.

Silk Noils.
Fawcett, Hughes.

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Singe Plates.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., Sons Co.
Taunton, New Bedford Copper Co.
Textile Finishing Machinery Co.

Singeing Machines.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., Sons Co.
Curtis & Marble Machine Co.
Firth, William, Company.
Knapp, Charles H.
Leigh, Evan A.
Smith, Drum & Co.
Stubbs, Joseph.
Textile Finishing Machinery Co.

Sizing, Starch and Gums.
Arabol Mfg. Co.
O. K. Soap Co.
Stein, Hirsch & Co.

Skylights.
Drouve, G., Co.
Lord & Burnham Co.
Lupton's, David, Sons Co.

Slashers.
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O. K. Soap Co.
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Spindles.
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Buckley, Benjamin, Sons, Gun Mill.
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American Blower Co.
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Buffalo Forge Co.
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Sturtevant, B. F., & Co.
Textile Finishing Machinery Co.

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Badger, E. B., & Sons Co.

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Goulds Manufacturing Co., The.

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Lunkenheimer Co.
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Stop Motion for Looms.
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Textile Finishing Machinery Co.

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Schnitzler, Chas. H.
Smith, Jas., Woolen Machinery Co.
Sturtevant, B. F., Co.
Wing, L. J., Mfg. Co.

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Warping and Beaming Machinery.
Draper Co.
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Draper Co.

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Lindsay, Hyde & Co.
Payne, George W. & Co.
Universal Winding Co.
Whiteley, William, & Sons, Ltd.

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Taylor, James.

Winders (Ball).
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Beck, Chas., Paper Co., Ltd.

Winders (Hosiery).
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Wood Pulleys.
Pittsburgh Gage & Supply Co.
Reeves Pulley Co.
Saginaw Manufacturing Co.

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Whittle, Jas. H.

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Wool Combing Machinery.
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American Tool & Machine Co.
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Firth, William, Co.
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Hood, R. H.
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Vacuum Dyeing Machine Co.
Whiteley, William, & Sons, Ltd.
Whittle, Jas. H.
Woonsocket Machine & Press Co.

Wool, Non-shrinking Process fur.
Heyer, Charles H.

Wool Oiling Apparatus.
Harwood, Geo. S., & Son.

Wool Oiling Compound.
Schoen & Schlichter.

Wool Oils.
Borne, Scrymser Co.

Wool Shoddies.
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Riverdale Woolen Co.
Slack, Wm. H. H., & Bro.

Wool Washing, Preparing and Drying Machinery.
American Drying Machinery Co.
Hunter, Jas., Machine Co.
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Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Riley, C. E., & Co.
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Banding.
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Toohey, M. J., & Co.

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B. C. ALVORD, Secretary.

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116 N. Third Street, Phila., Pa.

114 High Street, Boston, Mass.

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Salkeld, A. D., & Bro.
Sternberg, Fred, & Co.
Strouse, Theo. H., & Co.

Flax, Hemp, Jute and Ramie.
Fawcett, Hughes.
Moeller & Littauer.
Sternberg, Fred, & Co.
Tierney, F. A.

Gassed Yarns.
Ballou Yarn Co.
Greene & Daniels Mfg. Co.
Harding, Whitman & Co.
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Sternberg, Fred, & Co.

Glazed Yarns.
Ballou Yarn Co.
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Harding, Whitman & Co.
Indian Orchard Co.
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Malcolm Mills Co.
Moeller & Littauer.
Orswell Mills.
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Sternberg, Fred, & Co.
Strouse, Theo. H., & Co.
Walcott & Campbell Spinning Co., New York Mills.

Harness Twine.
Ballou Yarn Co.
Cranston Worsted Mills.
Fawcett, Hughes.
Moore, C., & Co.
Sternberg, Fred, & Co.

Hosiery and Knitting Yarns.
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Greene & Daniels Mfg. Co.
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Herbst, Albert, & Co.
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Jenckes Spinning Co.
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Moeller & Littauer.
Monument Mills.
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Harding, Whitman & Co.
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Lorimer, E. D.
Lorimer, Wm. H., & Sons Co.
Moeller & Littauer.
Montgomery, J. R., & Co.
Pennypack Yarn Finishing Co.
Sternberg, Fred, & Co.
Strouse, Theo. H., & Co.

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Harding, Whitman & Co.
Moeller & Littauer.
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Indian Orchard Co.
Jenckes Spinning Co.
Malcolm Mills Co.
Moeller & Littauer.
Montgomery, J. R., & Co.
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Tierney, F. A.

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Sauquoit Silk Mfg. Co.

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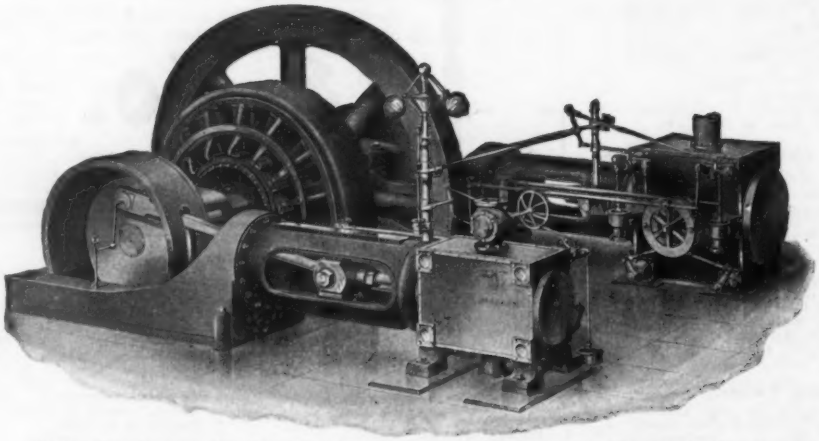

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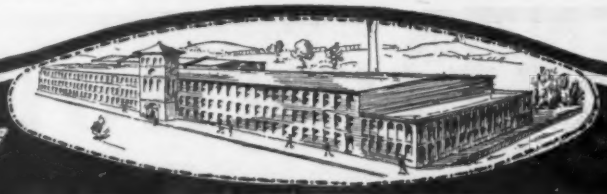

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Designer, thoroughly experienced in all kinds of worsted and woolen goods, from the raw stock to the finished goods, is open to an engagement as designer or superintendent. Age 37; English; married. Can furnish first-class references from past employers. 3140, Textile World Record.

Dyer on Cotton. Age 29; English. Chain warps, filling, raw stock, underwear and hosiery yarns. Print yarn. Cop bleaching. 1730, Textile World Record.

Dyer, bleacher and washer. Age 30; American; married. Cotton knit goods in either the roll or garment, long and short hose, raw stock and yarn, aniline or oxidized black on hosiery. Good references. 3081, Textile World Record.

Boss Dyer and Bleacher of cotton yarns, long and short chain and skein yarn. Good references. 3145, Textile World Record.

Overseer of Card Room. Scotchman. Excels on fine combed work. Familiar with all kinds of English and American machinery. Will go South, or wants states of Mass., R. I. or Conn. Good experience. 3144, Textile World Record.

Overseer of plain cotton weaving, or secondhand. A young American; married. Worked on prints, sheetings, shirtings, cambrics, lawns, twills and sateens. Familiar with Whitin, Mason, Colvin and Draper looms. 3143, Textile World Record.

Boss Finisher. Englishman; married. Experience covers over 25 years on all classes of goods, woolen and worsted and cotton mixtures of all grades. 3142, Textile World Record.

Boss Dyer on fast colors on wool and cotton. Expert on cotton fast blacks, on hosiery piece goods, warp and skein, Turkey reds and Union goods, and raw stock, fine wool and worsteds and carpet yarns, also mercerizing and bleaching. 3141, Textile World Record.

SITUATIONS WANTED.

The following advertisements are a portion of those of superintendents and overseers of whom full particulars are on file at this office. Manufacturers who may be in need of such men may address them in care of Textile World Record, or state their requirements directly, and the addresses of suitable men will be furnished without charge.

Any paid-in-advance subscriber may have his name placed on the list of those desiring positions, upon filling out the requisite blanks, furnished upon request. Correspondence is confidential.

COTTON SUPERINTENDENTS.

Superintendent Cotton Mill open to a position. Age 33; American; married. Good experience as overseer of carding in large mills. Combed and carded hosiery yarns, shirtings, sheetings, cheviots, madras. First-class references. 3096, Textile World Record.

Superintendent. Worked on ginghams and cotton warps of all kinds. Lowell, Whitin and Draper machinery. Age 41; American. Good experience. 3095, Textile World Record.

Superintendent. Would like position in South. Not particular about salary to start. Machinist and thoroughly acquainted with all kinds of card room machinery, also spinning frames. Taken superintendent course in textile school and has had 23 years of practical experience in the mill, mostly on fine yarn work. 3044, Textile World Record.

Cotton Mill Superintendent. Age 38; Scotch; married. All counts of American and Egyptian cotton from 10 to 60, twist and weft, warps, beams, and bundles and crape yarns, super quality. Familiar with Platt, Asa Lee, Howard & Bullough, Hetherington and Brooks & Doxey machinery. First-class references. 3042, Textile World Record.

Overseer of Cotton Carding. Age 32; married. Carded and combed yarn, fine and coarse, lenos, lawns, shirtings. English and American makes of machinery. References. 3025, Textile World Record.

Cotton Mill Superintendent, or assistant. Age 34; married. Worked on cotton machinery on coarse and medium numbers. Textile school education in designing, carding and spinning. 3003, Textile World Record.

Assistant Superintendent or boss weaver of cotton mill. Twenty-five years' experience. Unquestionable references as to character and ability. Thoroughly acquainted with plain, fancy box or lappet looms. Can take place on short notice. 3034, Textile World Record.

Superintendent of Cotton Yarn Mill or duck mill. A young man; American; married. Prefers position in the South. Worked in different departments, spinning, spooling, twisting, warping, reeling and balling and now ready for a superintendent's place. Unquestionable references. 3087, Textile World Record.

Superintendency of cotton mill wanted by a thoroughly practical cotton manufacturer of over 20 years' experience. Age 38; married. Temperate. Good manager. Fully competent to obtain full production at minimum cost and maintain best selling qualities. Highest references given. 1236, Textile World Record.

Superintendent. All kinds of fancy cotton, white and colored, plain and fancy, jacquard and box work, also silks and worsteds. Would take good overseer of weaving position. 3120, Textile World Record.

WOOLEN SUPERINTENDENTS.

Superintendent of small woolen mill. Piece dyed goods, thibets, Venetians, meltons, etc. 3114, Textile World Record.

Superintendent. Worked on cassimeres, unions, satinets, overcoatings, horse goods, bed blankets, linings, etc. Understands stock mixing, picking and figuring. Has had full charge of mill. 3074, Textile World Record.

Superintendent. Has made yarn and shoddies and about everything in woolen line. Good general knowledge of woolen manufacture. Familiar with English, Belgium and American carding, spinning and preparatory machinery. 3088, Textile World Record.

Superintendent or Overseer. 20 years' experience as overseer in both England and Scotland over combing, drawing, spinning, etc. Can work both long and short wools, get up all kinds of mixtures, instruct the shading of batches, etc. Has good references. 43 years of age. 3086, Textile World Record.

Superintendent. American; married. Worked on cassimeres, dress goods, cotton warps, and has had some experience on worsteds. Will go anywhere, but would like a good Western mill. Good experience. 3034, Textile World Record.

Superintendent, manager or designer. Age 37; English; married. Worsted and woolen goods for men's wear and rain cloths. Worked in English mills, and has also been employed in this country. 3103, Textile World Record.

Superintendent, age 34; American; married. Worked on fancy woolens. Not employed, and can take position at once. Will not go to Canada or West or South. Would take a good boss spinner place or assistant superintendent, but wants over $4.00 per day. 3104, Textile World Record.

Superintendent or designer of small or medium sized mill. All kinds of fancy worsteds, cassimeres, cheviots, overcoatings and dress goods. Age 31; married; Scotch. 3076, Textile World Record.

Asst. Superintendent or Overseer. 20 years' experience as overseer in both England and Scotland over combing, drawing, spinning, etc. Can work both long and short wools, get up all kinds of mixtures, instruct the shading of batches, etc. Has good references. 43 years of age. 3086, Textile World Record.

Superintendent or Designer. Age 37; American; married. All grades of woolens and also cotton warp goods. Will not go South or to Canada. 3124, Textile World Record.

Superintendent or boss weaver. 15 years' experience in worsted, woolen and silk goods. Graduate of Philadelphia Textile School. 32 years old; married. Good manager of help. American. 3119, Textile World Record.

Superintendent. Age 37; American; married. Woolen dress goods, fancy cassimeres, cloakings, etc. Will not go West, South or to Canada. First-class references. Graduate of Philadelphia Textile School, and also had good practical experience. 3126, Textile World Record.

COTTON CARDERS.

Carder in Cotton Mill. Coarse or fine, white or colored, hosiery, Egyptian, etc. Age 35; Canadian; married. 3029, Textile World Record.

Overseer of Carding. Large experience on all kinds of work and both English and American systems. Can furnish first-class references. Had charge of carding in some of the best New England mills. 3009, Textile World Record.

Overseer of Carding or cotton ring spinning. Worked on carded and combed Peelers, Egyptian, and Sea Island cottons, making yarns from 8 to 80. 3015, Textile World Record.

Overseer of Card Room. Had good experience in carding, and is an expert in the manufacture of combed yarns from the bale to the finished article. Good references. Wants no less than $18 per week, and will no go South or to Canada. 1745, Textile World Record.

Overseer of Carding. Has held all positions in picker and card rooms. White and colored goods, 5s to 40s. 3070, Textile World Record.

Overseer of Carding Mill. All kinds of fine yarns. Started up two of the largest card rooms in New England. Considered an expert in the manufacture of combed yarns from the bale to the finished article. First-class recommendations. 1745, Textile World Rcord.

Overseer of Cotton Carding. Worked on all classes of cotton, carded and combed, in counts to 135s. Will not go West or South. 3061, Textile World Record.

Overseer of Carding or Ring Spinning. Age 35; American. Sheetings, prin s and yarns, coarse and fine. Worked on most American machinery, but is more familiar with Lowell & Whitin. 1915, Textile World Record.

Overseer of Carding or Superintendent. Wide experience in large mills. Age 42; married. Finest of references. Will take large carding or superintendency. Familiar with all counts. 3133, Textile World Record.

Overseer Cotton Carding. Age 35; married; 12 years' experience as overseer. Worked on all kinds of yarns from 10's to 150's, combed and carded, and is familiar with all makes of English and American machinery. 2075, Textile World Record.

WOOLEN CARDERS.

Overseer for Washing, Carding or Combing wool for worsted wants to better himself. Speaks German, French and English. Best of references. 2083, Textile World Record.

Carder, or carder and spinner. German; married. Worked on all wool, wool and cotton, and shoddy mixes. Ten years' actual experience, and can furnish first-class recommendations. 2057, Textile World Record.

Overseer of Woolen Carding. Worked on all wool, wool and shoddy, wool, shoddy and noils. Wants $4 a day. Familiar with Davis & Furber, Furbush, Lombard and Bollette and Brown Patent. 3071, Textile World Record.

Overseer of Combing, washing, carding. Age 36, English, married. All classes of wool. Good experience and first-class recommendation. 3094, Textile World Record.

Overseer of Woolen Carding. Would accept secondhand position. All wool, cotton and wool, shoddies, mixes, worsteds. Does not wish for position on shoddy, but would consider one. Blankets, suitings, flannels. Understands spinning. 3093, Textile World Record.

Carder and Spinner. Been overseer 32 years, making every variety of cassimere, flannels, overcoatings, cloakings, dress goods, etc. Married; American. 3132, Textile World Record.

COTTON SPINNERS.

Overseer of Mule Spinning who has had a wide experience in large New England mills on yarns ranging from 24's to 160's is open to a position. 37 years old; American. Good references. 2003, Textile World Record.

Overseer Ring Spinning, or asst. superintendent. Sea Island combed from 6s to 30s, American from 6s to 50s; in fact, all grades of cotton, also expert on cable yarn. Prefers South, but will go anywhere. Wants $3.50 per day to begin with. 2020, Textile World Record.

Overseer of ring spinning, spooling, warping and dressing. Will not go South. Middle aged; American; married. Good experience and references. 3059, Textile World Record.

Boss Ring or Mule Spinner. Age 42; English; married. Asa Lee mules, Lowell Machine Shop, Platt, Mason mules; Howard & Bullough, Lowell and Mason frames. Yarns from 5's to 90's. 3001, Textile World Record.

Overseer of Cotton Mule Spinning. Understands Mason and English makes of mules. Has worked in mule room sixteen years, five years as second hand and a year and a half as overseer. 28 years old; married; steady and temperate. Would like to get work in N. E. or New York states. Has worked on colored hosiery yarn and filling. 1822, Textile World Record.

Overseer of Ring Spinning. Aged 42; American; married. Ginghams, sheetings, awnings, denims, etc.; $3 to $4 per day. 2018, Textile World Record.

Secondhand Spinner. Held positions of charge of cone and tube winding and spooling, also section of spinning frames. Cotton yarns 8's to 100's on twisters, spoolers, winders, warpers. 2030, Textile World Record.

Supt. of Cotton Mill, or overseer of mule or ring spinning is open to a position; 16 years' experience in Northern mills, on yarns, denims, awnings, apron checks, bicycle suitings, shirtings, etc., etc. Familiar with all well-known makes of cotton machinery; 29 years old; American; married. Can give references from large Massachusetts mills. 1527, Textile World Record.

Overseer of Cone Winding and spooling or ring spinning, who understands Universal, Foster, Broadbent and Payne winders, and Whitin and Mason frames, desires a position. Has worked on carded and combed yarns from 4's to 160's; also, mercerized, gassed and bleached yarns from 2 to 8 ply. Young man; American; married, and can give satisfactory references from large mills. 1960, Textile World Record.

Overseer of Spooling, warping, beaming, slashing and web drawing. Age 37; married. 3010, Textile World Record.

Overseer of Spinning. Age 34; married. Good experience. 20s to 90s Egyptian and American cotton. 3125, Textile World Record.

WOOLEN SPINNERS.

Roll Coverer wants an opening for work. Can cover cotton or worsted rolls, make aprons, or better, has had large experience. Can furnish tools. Work by piece or day. 1803, Textile World Record.

Superintendent woolen mill. Age 47; English; married. Wants New England or Middle States. 10 years' experience in first-class N. E. mills. 2028, Textile World Record.

Overseer of Warping, Spooling and Winding. Dress goods and cloth. Will not go to Canada. Aged 40; married. Good experience. References. 3027, Textile World Record.

Woolen Finisher. First-class. Familiar with all classes of goods and machinery. Can take full charge from loom to case. Has always been very successful. 1244, Textile World Record.

COTTON WEAVERS.

Overseer of Weaving or designer. Lawns, sheetings, twills, sateens, quilts, bedford cords, lappets. A young man; unmarried. Good experience and first-class recomendation. 3063, Textile World Record.

Overseer of Weaving. Englishman; 33 years of age; married. Worked on fine lawns, sheetings, sateens and fancies, coarse drills, twills, bicycle cloth, automobile cloth for tires. Familiar with Whitin, Crompton, Knowles, Mason, Kilburn & Lincoln and Lowell machines. 3073, Textile World Record.

Overseer of Weaving. Accustomed to fancies. Can do own designing and figuring. Good references from past employers. Is open to go anywhere. Had experience on many kinds of looms, including the Draper. 1731, Textile World Record.

Overseer of Weaving. Sheetings, sateens, ginghams, and dimities. Will not go South. 3116, Textile World Record.

Overseer of Weaving wants position. Practical experience from weaver, loom fixer, secondhand to overseer, on all kinds of looms and make of goods. References. Good manager of help. Married man; 35 years of age. 1806, Textile world Record

Overseer of Weaving. Age 35; Scotch; married. Good experience, and excellent references, Crompton, Whitin, Lowell, Colvin, Woonsocket and English looms. Sheetings, lawns, ginghams, flannels, fine worsteds, dress goods, shirtings and novelty goods. 2016, Textile World Record.

Practical Boss Weaver and loom fixer wants position. Good and long experience. Good record for big production; good quality and for being a good manager of help, and the getting and keeping plenty of good hands. A sober and steady man. Will go anywhere. Either cotton, woolen or jute. 1806, Textile World Record.

WOOLEN WEAVERS.

Overseer of Weaving, also designer. Men's wear, woolen and worsted, and fancies of all kinds, cotton worsteds, dress goods. Knowles and Crompton looms. Age 35. 3056, Textile World Record.

Overseer of Weaving, or would take good second hand job. Age 42; married. Worked on dress goods, suitings, plaid backs, cloakings, meltons and other classes of goods. Worked on Crompton & Knowles loom. 3016, Textile World Record.

Boss Weaver or assistant superintendent. Worked on all kinds of worsteds and woolens. Crompton & Knowles looms. Wants place at once. Middle aged; English; married. Good experience. Excellent references. 3062, Textile World Record.

Boss Weaver. Aged 38; married. Cassimeres, beavers, kerseys, dress goods, flannels, blankets. Worked on Crompton & Knowles broad looms. Good recommendation. 3066, Textile World Record.

Overseer of Woolen Weaving, or would take a secondhand job. 35 years old; married. Familiar with Crompton & Knowles looms. Good references. 3089, Textile World Record.

Overseer of Weaving or designer. Age 29; American; married. Thibets, meltons, kerseys, worsteds and cotton worsteds. Crompton & Knowles looms. Good experience. First class recommendation. 2051, Textile World Record.

Superintendent of Weaving. Englishman; married. Worked on fancy worsted and cotton dress goods and men's wear. First-class recommendations. 3111, Textile World Record.

Boss Weaver wants position. Very wide experience. White and colored, plain and fancy. Understands all kinds of looms. 335, Textile World Record.

DYERS.

Boss Dyer. Scotch; married. Wool, worsted, carpet and cotton yarn, piece goods, dress goods, raw stock. Will not go West, South or to Canada. Wants $3.50 or over. 3082, Textile World Record.

Dyer, bleacher and washer. Age 30; American; married. Cotton print goods in either the roll or garment, long and short hose, raw stock and yarn, aniline or oxidized black on hosiery. Good references. 3081, Textile World Record.

Dyer. Secondhand or overseer of small place. Single, steady man; 25 years old. Has had six years' experience on raw wool, cotton, yarn, shoddies and piece dyes. 3101, Textile World Record.

Dyer and Bleacher in black and colors. Age 36; married; Swiss. Cotton hosiery and yarn. 3051, Textile World Record.

Dyer or superintendent of dyeing and finishing. Age 34; English; married. Not less than $3.50 per day. All classes of woolen, worsted, mixed and cotton piece goods, bleaching, mercerizing. Can take charge from loom to case. 3121, Textile World Record.

Boss Dyer. A young man; married; American. Worked on wool, shoddy, cotton, silk noils, rags, camel's hair and piece dyes on satinets. Will accept $2 per day to start. 3122, Textile World Record.

Boss Dyer, mercerizer or bleacher. Scotch, married. Wool, yarns, piece, cotton and slubbing. Can take place at once. First-class recommendations. Familiar with all the latest improved machinery in the dyeing business. 3097, Textile World Record.

Boss Dyer. Twenty-six years' experience in all in woolen mills, 22 years being an overseer. Middle aged; American; married. Will not go South or to Canada. 3134, Textile World Record.

Dyer or chemist. A young man 26 years old; single. Cassimeres, dress goods, overcoatings, cloakings, etc. 3057, Textile World Record.

FINISHERS.

Finisher, both wet and dry. Age 28; English; married. Shirtings, ginghams, cotton dress goods, mercerized effects and men's cotton suitings and trouserings. Excellent references. 3007, Textile World Record.

Boss Finisher. American. Cheviots, cassimeres, beavers, dress goods, etc. Wants $2.50 to $3 per day. 3123, Textile World Record.

Woolen Finisher. Age 35; American; married; Wants $2.50 or $3.00 per day. Good experience. 3138, Textile World Record.

Overseer of Finishing, worsted goods, white or fancy. A young man; married; English. Has had full charge of piece dye finishing. 3019, Textile World Record.

Boss Finisher. Worked on broad cloth, cheviots, kerseys, coverts, meltons, piece dyes, dress goods. Prefers Massachusetts, but will go anywhere in New England. Not employed and wants place at once. Young man; American. 3046, Textile World Record.

Boss Finisher in a woolen mill. Worked on kerseys, meltons, cassimeres, satinets, cheviots, etc. Wants $3.50 per day. Will not go to Canada or West. 3077, Textile World Record.

Overseer of Cloth Room. Age 37; American; married. Wants $18 per week or over. 3110, Textile World Record.

Overseer of Finishing. Age 33; American; married. Meltons, coverts, cheviots, flannels, mohairs, etc. Wants position in New England, preferably Rhode Island. 3129, Textile World Record, Boston.

See also Page 219.

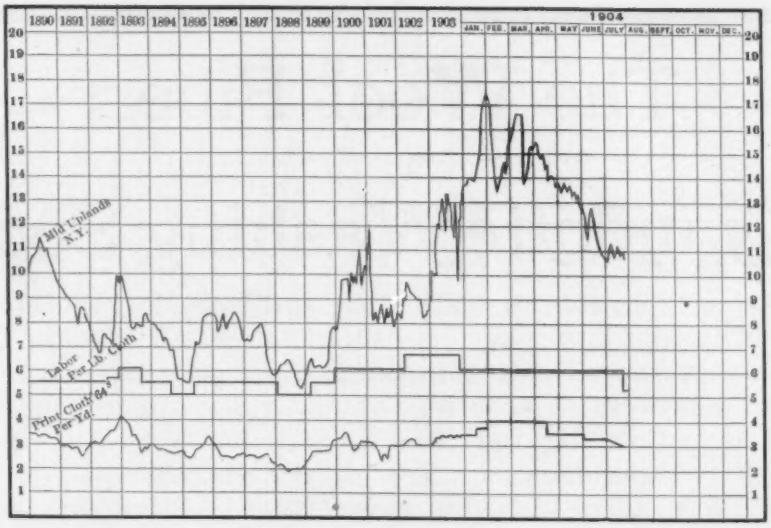

1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903
1904
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
Mid Uplands N.Y.
Labor Per 1b Cloth
Print Cloth 64 Per Yd

CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

The Cotton Market.

The price of cotton is the same as when our last report was written. Fluctuations have been within narrow limits. This is a significant fact in view of the many bearish influences at work, among which are the promising condition of the new crops, the voluntary short time among both foreign and domestic mills and the further curtailment due to the Fall River strike.

The present short time movement is the result of the scarcity of cotton and has not been brought about by the usual cause, lack of demand for goods. To be sure there is a lack of demand for goods, but this, like short time in the mills, is due in large measure to the scarcity of cotton. Where is the cotton coming from? That is the question on which hinges the operations of weavers, knitters and buyers of cotton goods. One thing is certain, cotton is scarce. The world's visible supply on July 22, is estimated by the Chronicle at 1,733,981 bales, as compared with 1,827,839 bales at same time in 1903, 1,911,570 bales in 1902, and 2,276,521 bales in 1901.

In other words the stock of cotton is 100,000 bales less than last year before the phenomenal rise in cotton to 17 1/4 cents. The great shrinkage in the consumption of cotton has brought the price down to 11 cents. This is still high. It should be borne in mind that the present time is between seasons and that, while cotton may be much lower than it was three months ago, comparatively little is to be had.

The Wool Market.

Prices of wool have advanced and sales have been large. The activity extended to all grades of wool and to all buyers, large and small. The market strengthened at a very opportune time, just as the light weight season opened, and contributed material support to the advanced prices for goods. A feature of the situation is the rapidity with which new wool is passing from the West to the mills. The high prices paid to growers by eastern dealers and which was a source of amazement to many have been quickly justified by events. The early buyers of the new clip have sold a large part of their wool to the mills at a substantial advance and are in no danger of repeating the experience of former years by carrying heavy loads of high priced wool until the mills were ready to take the stock at cost or less.

The sales of light weight goods are fully equal to the average of normal years. While the advances in prices have been made on only a part of the lines, yet a distinctly strong tone prevails

(Continued on page 205.)

C. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice-Pres. and Sec'y.
Established 1860—Incorporated 1893.
THE S. BLAISDELL, JR., CO.,
COTTON, EGYPTIAN PERUVIAN
American Long Staple a Specialty. Shipments direct to mill from Egypt, Peru and all American Southern Points.
CHICOPEE, MASS.
Cotton Waste Purchased on Yearly Contract from Mills.

The Wool Fiber

—AND—

Wyandotte Washing Soda

Owing to its delicate texture and brilliancy, its natural softness and openness, the wool fiber should always be scoured by a process that works the least injury to these properties.

In the process of scouring, should this softeness be destroyed by subjecting the wool to any harsh treatment, its strength and soundness are also destroyed, consequently the quality and value of the yarns and cloth is lessened in proportion to the damage incurred to the fiber.

Use Wyandotte Washing Soda for Wool Scouring.

None Genuine except with a card bearing this Trade Mark

In Every barrel.

Wyandotte Washing Soda, while one of the soda compounds, is yet entirely different from what are commonly known as alkalies. It is an absolutely new product and owes its special virtue and detergent properties to new facts, because of which it will accomplish many acts wholly impossible with any other product.

Wyandotte Washing Soda used with soap for wool scouring preserves all that natural softness, fineness and strength impossible to obtain when using pure alkalies. Try it,—you will be convinced.

THE J. B. FORD CO., Sole Mfrs.

WYANDOTTE, MICH.

You will be welcome at our exhibit, Agricultural Building, Block 56, Aisle B, World's Fair, St. Louis.

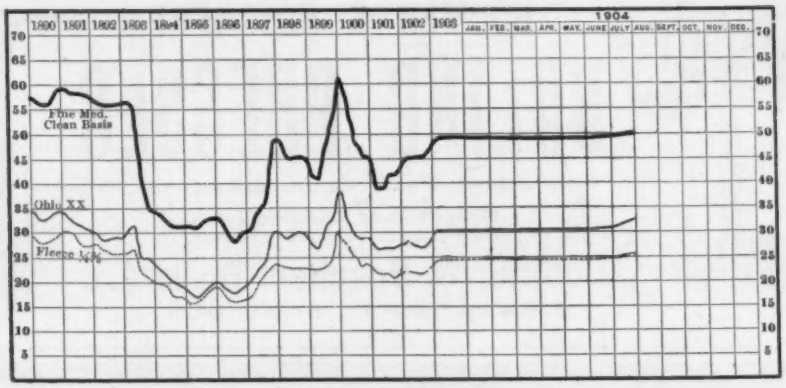


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

throughout the trade. The reassuring prospects of the political situation have done much to eliminate the "presidential year" bugaboo, and business men are settling down to the conclusion that no serious danger threatens the commercial and industrial world.

Another factor is the strength of wool abroad. The London sales closed at a fair advance and prices of foreign are still farther above the importing point.

While the markets for wool and woolens are in this strong position, it would be a great mistake to assume that we are on the eve of a boom. That calamity, fortunately, is not likely to be repeated. It is possible, but not probable. A material advance above the present level will be met by an increase in the use of wool substitutes. That is the safety valve which will prevent inflation of prices to the bursting point. In fact it is constantly in operation. For proof of this one has but to look at the former woolen and worsted mills that now use little besides cotton yarn.

Pennsylvania, Philadelphia. Labor troubles, combined with a scarcity of orders, have compelled the proprietors of the Chelton Manufacturing Co.'s mill to shut down the plant. The machinery, etc., are now being placed in good condition and ready for operation, but they cannot say when the factory will be started up again. They manufactured woolen and carpet yarns on 7 sets.

Shrinkproof

SOMETHING NEW
Prevents Woolen Goods from Shrinking
Charles H. Heyer
1501 Real Estate Trust Building
Philadelphia, Pa.

Established 1848. Telephone Connection.
JAMES J. TULLY,
Manufacturer of
Fulling and Scouring Soaps
179-181 Master Street,
MILL SOAPS a Specialty. PHILADELPHIA.

STANDARD QUALITY COMBED RAMIE TOPS and NOILS a Specialty. RAMIE YARNS in All Numbers for All Purposes
SOLE AGENT,
FRANK A. TIERNEY,
WOOL, TOPS, NOILS, YARNS,
Fine, Medium and Coarse Wool Tops. Mohair Tops. Camel Hair Tops. Fine, Medium and Coarse Wool Noils. Mohair Noils. Camel Hair Noils. Silk Noils.
Special Fibres and Novelties for Woolen, Cotton and Silk Manufacturers.
Room 203, Wool Exchange Building, 260 W. Broadway, NEW YORK.

KNUCKLE JOINT.

BOOMER & BOSCHERT

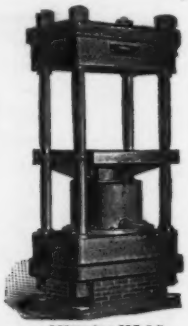
BALING PRESSES

ARE THE STANDARD

Hydraulic or Knuckle Joint
Any Size .. Any Power

Boomer & Boschert Press Co.

338 West Water St., SYRACUSE, N. Y.



HYDRAULIC.

EASTON AND BURNHAM MACHINE CO.,
Pawtucket, R.I.

ALL KINDS OF Spindles USED IN THE MANUFACTURE OF COTTON, WOOL & SILK

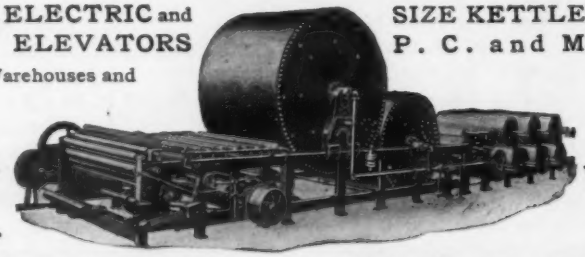
IMPROVED UPRIGHT SPOOLERS
TO SPOOL FROM COP, SKEIN, OR BOBBIN.

The COHOES SLASHER.

BELT-DRIVEN, ELECTRIC and HAND-POWER ELEVATORS
For Cotton Mills, Warehouses and Factories.

PULLEY BLOCKS.

OVERHEAD TRACKS.



SIZE KETTLES. REPAIRS for P. C. and M. MULES and EMPIRE LOOMS.

WATERWHEEL GOVERNORS.

The COHOES IRON FOUNDRY & MACHINE CO, Cohoes, N. Y.

LOOK!

THE BRANDEN RUBBER PUMP VALVE
Will Outlast Three Ordinary Valves.

Made for hot or cold water or any fluid where rubber valves are used. By its construction will outlast several ordinary valves. A trial will demonstrate the truth of our statements.

JOHNSTONE BLOW-OFF VALVE. A most durable and useful valve.

Pressure and Vacuum Gages. Pop Safety Valves.
Steam Engine Indicators. Whistles, Lubricators, Etc., Etc.

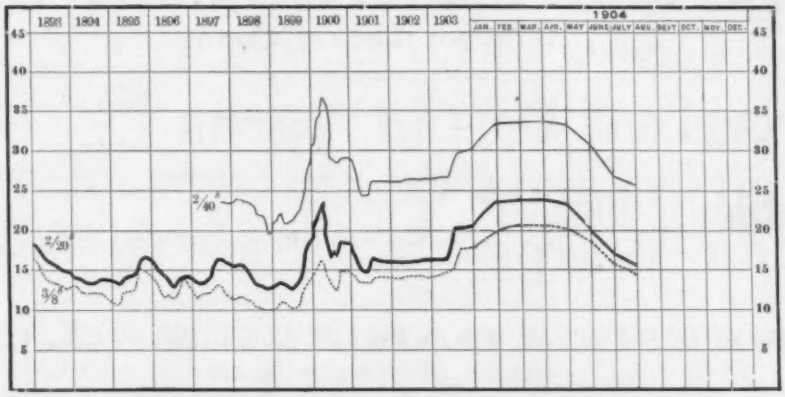
CROSBY STEAM APPLIANCES ARE UNEXCELLED.

CROSBY STEAM GAGE AND VALVE CO.,

Stores: Boston, New York, Chicago, London.

Office and Works: BOSTON, MASS.

Yarn Department.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

Eastern Yarn Market.

If cotton yarn is to be spun from cotton, yarn prices must be based on the cost of cotton. In some cases this self evident proposition is disregarded, and yarn is sold at prices that mean a loss to the spinner. As a rule, however, the decline in the yarn market has been checked before the danger line had been reached. Business is confined to spot transactions as neither buyer nor spinner is willing to make pledges for future business. The predictions of a large crop are taken with several grains of salt. Spinners cannot spin a merchantable yarn from cotton that is not yet harvested. The disposition on both sides is to wait. Spinners are curtailing production and buyers are confining their purchases to actual requirements. Prices for yarn are low when compared with the high price of cotton. The ideas of spinners, weavers and knitters are still confused by the abnormal situation in the markets for both raw material and goods. The domestic trade has not recovered from the speculative whirl of the past six months. The conviction has been forced upon the spinners that the cost and selling price of yarn are controlled by the balance of many conflicting influences, such as the weather in the South, the boll weevil, the market conditions abroad and the purchasing power of the consumer. With so many uncertain factors in control it is the part of wisdom for the spinners to follow their present policy of confining their obligations to spot business. We quote as follows:

Eastern Cops.

6's	17¼
8's	17½
10's	17¾
14's	18¾
16's	19¼
18's	19¾
20's	20¼
22's	20¾
24's	21¼
26's	21¾
30's	22¾
34's	23½
36's	24
40's	25

On cones, ¾c. more up to 14's; 1c. more from 15's to 22's; 1½c. from 23's to 35's, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12's	19
14's	19½
18's	20½
20's	21
22's	21½
26's	22
28's	22½
30's	23
36's	25
40's	26
45's	29
50's	31
55's	33
60's	36

Eastern Two-Ply Warps, Carded Peeler.

2/30's	24
2/36's	26
2/40's	27
2/45's	30
2/50's	32
2/60's	37

Egyptian Weaving Yarns.
Single Skeins Combed.

30's	33
35's	34
40's	35
45's	36
50's	40

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

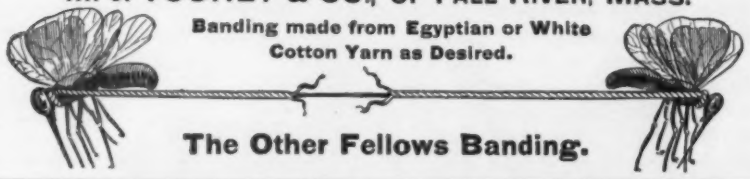
Colored and Bleached Yarns Furnished in any manner desired by the trade.

Pawtucket, R. I.

THESE MULES CANNOT BREAK THE BANDING —MADE BY—

M. J. TOOHEY & CO., OF FALL RIVER, MASS.

Banding made from Egyptian or White Cotton Yarn as Desired.



The Other Fellows Banding.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

COTTON WARPS

HOUSATONIC, MASS.

4s to 60s.

Dana Warp Mills

WESTBROOK, .. — .. MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

55's	46
60's	48
70's	52

Two and Three Ply Skeins, Combed.

30's	34
36's	35
40's	36
45's	38
50's	41
55's	45
60's	50
70's	55

Philadelphia Yarn Market.

Business in all textile lines has been very dull. The demand for yarn has been limited practically to spot delivery from stock, and prices have continued to decline until they are undoubtedly below the cost of production. Spinners who are in position to do so are shutting down, waiting for the new crop and better business. Some fair sized contracts are being placed for delivery through the fall and winter. The prices on these contracts are lower than the present price of cotton warrants.

Buyers of knit goods have been holding off expecting prices to be lower and manufacturers are offering knit goods at last year's prices, and in some instances, are cutting last year's figures. For a number of years, yarn sold in the summer time for delivery during the fall and winter has been sold at a considerably lower price than could have been obtained at the time of delivery and it looks as if this will be the situation this season.

Buyers of Egyptian yarn have placed orders for large quantities to run them until new cotton arrives, at about the lowest prices ever reached on this class of yarn. Prices today are about as follows:

Southern frame spun cones:—

7's and Coarser	17
8's and 9's	17
10's	17-17½
12's	17-17½
14's	17½
16's	17¾
18's	18
20's	18½
22's	19
24's	19½
26's	20
30's	21
40's	26
50's	32

Southern high grade mule yarn:—

Cones.

10's	18
12's	18½
14's	19
16's	19½
18's	20
20's and 22's	20½-21

PAULSON, LINKROUM & CO.
Successors to BUCKINGHAM, PAULSON & CO.
Commission Merchants
COTTON YARNS of all Descriptions
83 Leonard St., NEW YORK
302 Chestnut St., Phila. 210 Munroe St., Chicago, Ill.
Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited.

JAMES E. MITCHELL CO., COMMISSION MERCHANTS.
Cotton Yarns
FOR ALL PURPOSES.
122-124 Chestnut Street, PHILADELPHIA, PA.
Brown Building, 185 Summer Street, BOSTON, MASS.

CATLIN & CO.,
Cotton Yarns
345 Broadway, NEW YORK.
67 Chauncy Street, BOSTON.
206 Chestnut Street, PHILADELPHIA.
605 Medinah Temple, CHICAGO.

Harding, Whitman & Co.,
Dry Goods Commission Merchants,
COTTON AND WORSTED YARNS.
BOSTON. NEW YORK. PHILA.
CHICAGO. BALTIMORE. ST. LOUIS.

A. D. SALKELD & BRO.,
With FRED'K VIETOR & ACHELIS,
YARNS.
66-72 LEONARD STREET, - NEW YORK.

Fred Sternberg & Co.
530 Broadway, - NEW YORK.
MERCERIZED TURKEY RED GASSED } COTTON YARNS.

E. D. LORIMER & CO.
COTTON YARNS } ALL NUMBERS
MERCERIZED YARNS } FOR ALL PURPOSES
346 BROADWAY, NEW YORK.

MOELLER & LITTAUER,
SILK, WORSTED, WOOLEN YARNS COTTON AND MOHAIR
Polished Threads and Tinsel. Artificial or Wood Silk.
Mercerized, Turkey-Red, Fine Gassed Yarns.
109 GREENE ST., NEW YORK

CAPACITY, 50,000 Spindles. **ORSWELL MILLS** FITCHBURG, MASS.

COMBED **COTTON YARNS** CARDED

In Chains and Skeins, on Balls, Beams, Spools—Single or Twisted.

THE MALCOLM MILLS CO.,

MANUFACTURERS OF

FANCY YARNS and POLISHED THREADS.

Offices: 229 Chestnut St., Philadelphia.

Mills: Frankford, Pa.

KROUT & FITE MANUFACTURING CO.,

Manufacturers of

Silk, Cotton and Mercerized Narrow Fabrics

Spool Tapes a Specialty.

Telephone Connection. Office and Mill, Allegheny Ave. and Emerald St., PHILADELPIA.

Walcott & Campbell Spinning Co.

Fancy Hosiery Yarns

IN ALL COLORS

New York Mills, Oneida Co., New York

J. H. ENGLISH & CO.,

Commission Merchants.

COTTON YARNS

108-110 Franklin Street, New York, N. Y.

Consignments Solicited from Southern Mills. Liberal Advances made and Sales Cashed Promptly.

Indian Orchard Company

Cotton Warps and Yarns. In Gray and all Colors. Single or two or more Ply and Cable Cord.

Novelty Yarns. in Various Patterns. Colors and Twists.

Carded and Colored Cotton. For Mixing with wool, Machined or in Roving.

Indian Orchard, Mass.

E. MORGAN, PRES. H. K. WRIGHT, TREAS. W. C. GODFREY, AGT.

24's	21½
Southern frame yarn, lower grades:—	
6's and 8's	16
10's	16½
Eastern cones (high grade quality):—	
10's	19
12's	19½
14's	20
16's	20
18's	21
20's and 22's	21½-22
Skein yarn (mostly Southern:—	
4's to 8's soft	15½
10's to 12's	16-16½
14's to 20's	16½-17
22's	17½
14/2	16
16/2	16-16½
20/2	16½-17
30/2	18-19
40/2	25
16/3 slack	16
12/3 slack	16
8/3 carpet	15½
8/3 slack	15½
9/4 slack	15½
Warps (mostly Southern):—	
10's to 12's	15¾
14's	15¾-16
16's	16-16¼
20's to 22's	16½-17
26's	17½
14/2	16
16/2	16½
20/2	17
24/2	17½
30/2	18½
40/2	25
Mixed colored yarns (mock twist, half colors):—	
6's to 10's	18½-19
12's to 14's	20-20½
16's to 18's	21-22

Silver and jaeger, 1½c. over white.

Mock Egyptian, 2c. advance over white.

Egyptian, 4c. to 5c. above best quality white.

Worsted Yarn.

Spinners have been securing many orders and prices are advancing—the orders have been placed by the men's wear trade—the small orders ranging from 5,000 to 10,000 lbs. have been placed to fill the actual requirements of the weavers, but the larger orders, and we hear of one weaver who has placed orders for 700,000 lbs. of 1/4 Blood yarn, are purely speculative and based on the expectations of some of the wool buyers, that quarter-blood wool will sell before Sept. for 30 cents per pound in the grease. To appreciate this wild prediction we must remember that when these wools are on a normal basis the price is about 20 cents per pound in the grease.

TRY OUR
Silkine, also Lisle Silk
FINISH
—FOR—
Hosiery, Knit Goods, Yarn, Fast Black, Harsh Colors, and Fibres.
O. K. SOAP CO., 968 Franklin St., PHILA.

LINEN YARN IMPORTER.
HUGHES FAWCETT, 115 Franklin Street, NEW YORK.
Flax, Hemp and Jute Line and Tow Yarns, For Weaving Purposes.
Linen Jacquard Harness Twines, Fine Cotton Harness and Heddle Twines, For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

Mercerized and Plain
Skein, Warps, Cones, Cops, Tubes
COTTON YARNS
426 and 428 Market St., Phila.
Theo. H. Strouse & Co.

Ballou Yarn Co.
PROVIDENCE, R. I.
Harness and Seine Twines and other Job Gassing, Winding, etc. All Numbers.
GASSED YARN SPECIALTIES

American Cotton Yarn Exchange
COMBED and CARDED
COTTON YARNS
From Northern and Southern Mills.
American, Egyptian, Peruvian and Sea Islands.
ARNOLD B. SANFORD, Pres. and Gen. Mgr.
PERCY H. de MAURIAC, Vice President.
OFFICES: 67 Chauncy St., Boston.
240 Chestnut St., Philadelphia.
108 Franklin St., N. Y. with James Talcott.

F. C. BARTON
MANUFACTURER OF LILY BRAND NARROW FABRICS
RIBBONS, TAPES, BINDINGS & NON ELASTIC WEBBINGS
54 FRANKLIN STREET, NEW YORK

ALLEGHENY WORSTED MILLS,

Thomas Wolstenho'me Sons & Co.,
MANFRS. OF
ALL NUMBERS
SINGLE AND TWO-PLY,
On Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural and Fancy Mixes.

Worsted
YARNS
Sell Direct,
Office and Mills, Frankford Ave. and Westmoreland St., Phila, Pa.

POCASSET WORSTED COMPANY,

Worsted Yarns.

OFFICES:
6th Floor, Banigan Building,
PROVIDENCE, R. I.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—White or colors, in skeins, on spools, cones, or shuttle bobbins.

Novelty Yarns—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making yarns only.

Genapped Yarns of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

DYERS OF YARN AND SLUBBING. BRISTOL, R. I.

French System. B. F. BOYER CO., Bradford System.
MANUFACTURERS OF
WORSTED AND WOOLEN YARNS,
Office and Mill, Delaware and Cooper Streets. CAMDEN, N. J.

Woolen and Merino YARNS
Eaton Rapids Woolen Mills,
EATON RAPIDS, MICH.

EDDY & STREET,
Cotton, Woolen,
Yarns and Braids
Worsted, Spun Silk.
PROVIDENCE, R. I.

RICHARD CAMPION,
SELLING AGENT FOR
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Highland Worsted Mills,
Loridan Worsted Co.,
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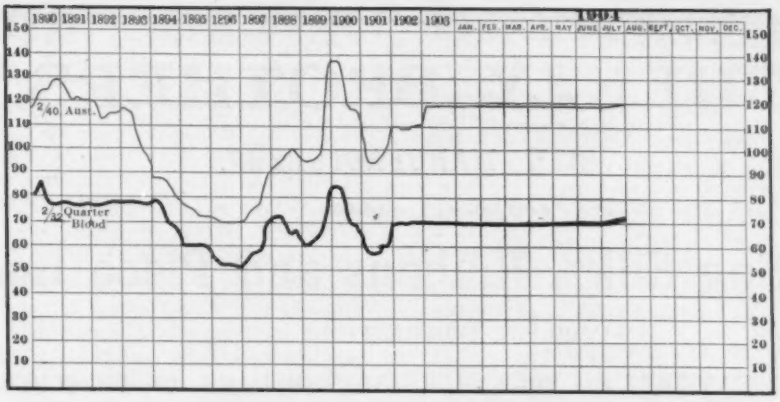


CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

Just where this movement is going to bring the price of quarter-blood yarn the spinner must figure out. The more conservative state that the prices these yarns are being sold at is entirely unwarranted and will kill the sale of these yarns before the season is over.

There seems to be some uneasiness on the part of the spinners and while many orders have been secured many orders have been lost because of the advance. The demand seems to be mostly for 1/4 to 3/8 Blood yarn in 2/26 to 2/30's. One very large spinner who also weaves largely opened up his cloth at last year's prices, but when he tried to cover himself for wool out of which to make his yarn he found it impossible to get it at a reasonable price and has been forced to make two advances on the price of his cloth. Much 2/32's black and white, double and twist for cross dyeing is in demand and many of the weavers have secured large orders for this class of yarn. The mills buying yarn earlier in the season are able to meet prices which are simply impossible to those who buy on today's market. Some of the spinners have arrangements with weavers whereby they are offered prices which may or may not be taken up inside of three months, and the spinners covered themselves on wool on this basis of proposition. Some of the buyers for the large spinners went West with fixed ideas as to what they would pay, but found it necessary not only to advance those

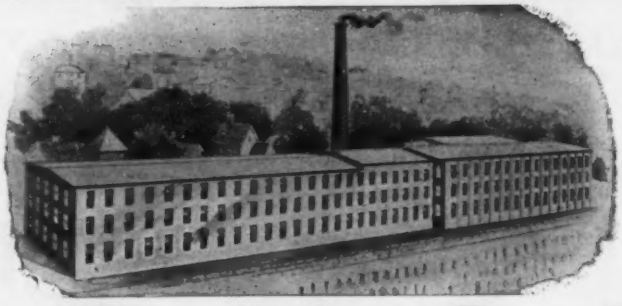
SILK NOILS AND SILK NOIL YARNS
In White and Colors.
A. T. SKERRY & CO., 47 Leonard Street, NEW YORK.

MOHAIR LOOPS, KNOTS AND FANCY YARNS FOR DRESS GOODS & CLOAKINGS.

QUEENSBURY MILLS WORCESTER MASS.

MOHAIR TOPS AND YARNS FOR WEAVING

LUSTRE YARNS FOR SERGE LININGS
ALPACA YARNS



SPINNERS OF MOHAIR YARNS FOR ZIBELINES

DRESS GOODS YARNS
KNITTING YARNS
WORSTED YARNS

MOHAIR

CHENEY BROTHERS,

SILK MANUFACTURERS,

——ALL KINDS OF——

Knitting Silks, Ribbons and Piece Goods

USED FOR TRIMMING KNIT GOODS.

TRAMS, ORGANZINES and SPUN SILKS, IN THE HANK, OR ON CONES, FOR MANUFACTURERS' USE. SILK FOR SPECIAL PURPOSES MADE TO ORDER.

Mills: SOUTH MANCHESTER and HARTFORD, CONN.

SALESROOMS:

477, 479 and 481 Broome Street, NEW YORK.
929 Chestnut Street, PHILADELPHIA.
79 Chauncy Street, BOSTON.
239 Fifth Avenue, CHICAGO.

WILLIAM RYLE & CO.,

Foreign and Domestic

Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., NEW YORK.

SAUQUOIT SILK MFG. CO.,

Insulating and Braiding Silks.

ORGANZINE, TRAM and HOSIERY SILKS

Fast Dye Organzines for Woolen Manufacturers a Specialty.

Mills: Bethlehem, Pa., Philadelphia, Pa., Scranton, Pa. New York Representatives, Wm. Ryle & Co., [54 Howard St.—Phila. Office, 4015 Clarissa St. (18th St. and Hunting Park Ave., Nicetown.)—Chicago Office, 210 Monroe St.—Boston Office, 78 Chauncy St.

Crochet Lace Edgings

Spun Silk, Splicing Yarn, Mercerized Yarns, Cotton Warps, Sewing Threads, Tapes, Braids, Domets, Cambrics, Silesias. : : :

Write for Prices and Samples. George W. Chapin 229-231 Church St. PHILADELPHIA

ideas but bought wool on the sheep's back to get what was required.

The only class of business showing any improvement is men's wear and the spinners are advancing prices on 1/4 Blood wool to such an extent that the trade is swinging off on high half blood-quality yarn. That is certainly the trend of the trade today. Weavers are getting out new samples with this grade of yarn in it. The present situation on the buying end of the cloth market does not warrant any such activity in wool and yarn. The dress goods manufacturers are very slow and are placing no orders for yarn. Said one of the leading manufacturers, "I know less today what the market requires than has been the case at any time in my career. I do not know what is going to sell and the buyers themselves do not know."

French spinning is dull and but few orders are being secured for immediate delivery and orders taken earlier in the season are about run out so that if more business is not forthcoming many of these plants must shut down. Some orders are being offered for delivery in March, but are being declined by the spinners. Some of the combers are busy and this will increase as the season advances. We quote as follows:

2/40's Australian	1.20
2/40's XX Delaine	1.10
2/40's Half Blood	1.05
2/20's Half Blood	.85
2/36's 3/8 Blood	.75
2/26's 1/4 Blood	.68

Woolen Yarn

Woolen yarn spinners are beginning to feel a curtailment of production on the part of knitters and others who are beginning to run short of orders. It is believed by the manufacturers that the present slowing down is only a temporary lull in business and will be only of three or four weeks duration. Spinners are beginning to feel loss of

You Save Enough Insurance to Pay for the Equipment.

So it costs you NOTHING to have the AMERICAN WATCHMAN'S CLOCK. Fully approved by all insurance companies. We equip factories with Fire Alarms, Signals, etc., also Employee's Time Recorders, and Telephone Systems. Electric Time System consists of Master Regulator in office with secondary electric clocks throughout the mill, insuring accurate time. Send for particulars.

Pettes & Randall Co., 150 Nassau St., New York

Speed & Stephenson,
WORSTED and WOOLEN
YARNS
A SPECIALTY.
ALSO TOPS.
170 SUMMER ST., BOSTON.
Long Distance Tel. 4168-2 Main.

JENCKES SPINNING CO.,
Formerly E. JENCKES MFG. CO.
Carded and Combed Cotton Yarns for Weavers and Knitters.
Double and Twist Yarns for Woolen Trade.
PAWTUCKET, R. I.

WILLIAM B. CHARLES,
Cotton Yarns,
Cotton Cloth,
Silesia, Sateens,
For the Underwear Trade.
AMSTERDAM, N. Y.

GRANT YARN CO.,
COMBED AND CARDED COTTON.
YARNS 40's and above. AND
FITCHBURG, MASS. WARPS

FLOSSETTE MILLS
of the
New England Thread Co.
CENTRAL FALLS, - - R. I.
(DYERS and BLEACHERS) and MANUFACTURERS of
High Class Threads on Tubes, Spools and Cones and MERCERIZED YARNS for Knitting.
GLAZING OF YARNS
For the Shoe Lace. TAPE and WEBBING TRADE.

C. MOORE & CO.,
Manufacturers of
TWINES, THREADS AND YARNS,
Jacquard Harness Twines of all kind on hand and made to order.
S.W. Cor. Fifth and Market Sts., Phila.

HOFFMAN, DeWITT & McDONOUGH,
Diamond Stay Bindings TRADE MARK
Manufacturers of
Tapes, Webbing and Bindings.
COTTMAN and G STS., PHILADELPHIA
Ryer's Station, P. & R. R. R.
Bell Telephone, 203 Cheltenham.

YARNS Solis, Boston.
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SUMMER STREET.
ANDREW J. SOLIS, Jr. & CO.

E. G. HARPER,
WORSTED and WOOLEN YARNS,
MERCERIZED COTTON,
395 BROADWAY, TEL. 1020 FRANKLIN NEW YORK.

FAULTS!

If you see fluid oil going to waste every day around your mill and don't send for a free sample of **NON-FLUID OIL,** that's your fault.

If you do try a sample and don't send us an order afterward, that's our fault—but we have mighty few faults of this nature.

N. Y. & N. J. LUBRICANT COMPANY,
17 Church Street, NEW YORK CITY.
14 McAllister St., SAN FRANCISCO.

JOSEPH M. ADAMS CO.
WOOLEN YARNS,
Carpet Backing and Rug Yarns a Specialty.
ARCOLA MILLS,
Main St., foot of Centre St., Manayunk, Phila.

Knitting and Weaving
YARNS.
Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.
EDWARD S. HYDE,
226 CHESTNUT STREET,
Philadelphia, Pa.

Woolen and Merino Yarns,
1 to 10 Runs, at reasonable prices.
All Wool, Mohair and Wool Spun or Mixed Cotton and Shoddy Yarns, in white, gray, and colors.
Dress Goods Yarns a Specialty.
E. M. ROCKWELL, - - LEOMINSTER, MASS.

orders through these curtailments. Said one large user of yarn: "We have had our orders suddenly cut off. We have been forced to shut down part of our plant and in justice to ourselves we have been obliged to lay off some of our spinners. The manufacturer who employs outside spinners dislikes much to see another party get his machinery space because he knows that the spinners are about evenly balanced with those desiring yarn spun and great are the inducements and promises made spinners to hold machinery space until the mills start running again.

The weavers who six weeks ago were forced to hold up are again busy and are employing their usual amount of outside machinery. The tendency among the dress goods manufacturers is to use more woolen spun yarn and as many of these mills are not fitted up with spinning, much outside yarn will be purchased.

The eiderdown and French flannel trade has slowed down as has also the rubber boot trade. The hosiery knitters are buying yarn and are also employing outside machinery; this is particularly true of the knitters of cheap hosiery. Much merino yarn is being used for fine hosiery, but worsted yarn has more or less displaced woolen yarn in some lines. Most of the yarn being spun today is on contracts placed early in the year. This yarn is cheaper by cents per pound than the same yarn would cost on today's market and many of the spinners are making this yarn at a loss on account of the advance in Peruvian cotton. The spinner covered on his wool, but did not order his Peruvian cotton. This cotton is some lower than was the case earlier in the season.

The knitters throughout New York State in some instances are busy, but the majority are running slack. These knitters do not understand the reason for the excitement in the wool and yarn market. They have just gone through their experience with cotton and cotton yarn and they remember that earlier in the year cotton was selling for 17 to 18 cents per pound and they were then told that cotton was going to 20 cents.

The price of Australian lamb's wool keeps up and there is very little on the market. Knitters are buying much carbonized Nevado lamb's to take its place for the present. Australian and domestic thread waste are scarce owing to the spinners running almost wholly on coarse yarn. The tops are all cleaned out of the market and prices are well maintained.

WEIMAR BROS. MANUFACTURERS OF **Cotton Mercerized Tapes,**
SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES.
Phone Connections. Works, 2046-48 Amber Street. PHILADELPHIA, PA.

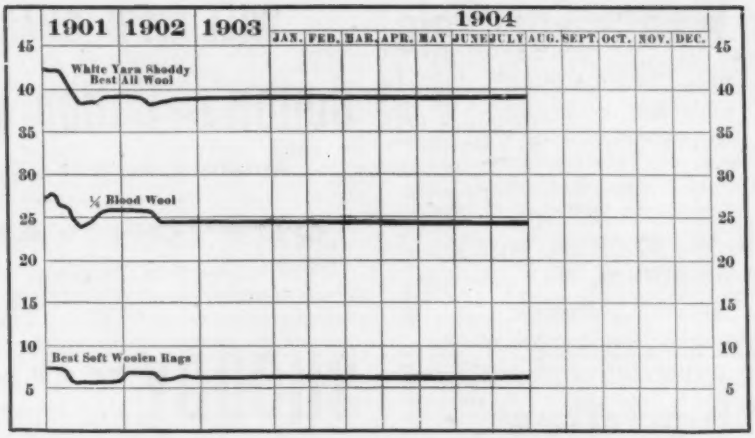

CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

The Rag and Shoddy Market.

Under the influence of higher prices for wool, the rag and shoddy market shows signs of a revival from the lethargy that has prevailed for so many months. The market has been strong in spots. Dealers have marked up prices on certain grades and exhibited a decided unwillingness to trade except on their own terms. The rag and shoddy markets differ widely from other textile raw material markets in respect to the supply. All the cotton or wool that is grown is offered for sale. The supply of rags, however, does not measure the amount offered for sale. If the demand for shoddy falls off the rags are not collected. Thus the balance of supply and demand in the rag market is automatically adjusted. High prices cause the rags to be utilized. Low prices result in their remaining a waste product. This is the reason of the sound conditions that prevail in the market for wool substitutes.

With supply and demand automatically adjusted the dealer is in a position to take advantage of any improvement in the demand. That is what is taking place now. Sales of both rags and shoddy are small as is generally the case during the light weight season, but the market is vibrating in unison with the wool trade.

SHODDIES AND EXTRACTS.

White yarn, best all wool	38-40
White knit, all wool, best, fine	28-32
White knit, No. 2	23-25
Light yarn, extra fine	25-28
New pure indigo blue	23-25
Merino.	
Fine light, all wool, No. 1	24-25
Medium light, all wool, No. 1	16½-17½
Medium light, all wool, No. 2	14-16
Fine black, all wool	20-22
Fine dark, all wool, best grade	20-21
Medium dark, all wool, No. 1	13-15
Medium dark, all wool, No. 2	12-13
Red knit stock, strictly all wool	19-20
Red flannel, all wool	19-20
Dark blue for hosiery, strictly all wool, No. 1	17-20
Dark blue for hosiery, not all wool, No. 2	12-14

DELAINE EXTRACTS.

Light	19-22
Medium light	15-17

WOOLEN RAGS.

Regular gray	12-13
Black	14-15
Fancy colors	16-20
Fine merchant tailors, all colors	9-11
Choice light colors	13-15
Browns	12-13
Blacks	9½-10½
Fine blues, plain	9-11
Fine dark	10-11
Medium dark	7-8
Worsteds.	
Blue	16-18
Black	18-20
Serges.	
New black	15-16
New blue	14-15
Flannels.	
New scarlet	18½-22
New blue	17-18
Cloakings	3-4

SOFTS AND KNIT STOCK.

Soft woolens, best	7-7½
Old white flannels	14-16
White flannels, No. 2	11-12
Old red flannels	9½-10
Light blue flannels	7½-9
Old blue flannels	6-7
Fine worsted, new black	26
New blue clip, best, fine	20-22
Dark mixed yarn, extra fine	22-24
All wool yarn, medium and coarse grades	15-20
Old plaids	5-7
White stockings	17-18

Cotton Waste For Sale.

Have large lines of Soiled Card, white and colored Oily Card and other Cotton Wastes suitable for the manufacture of Cassimeres, Satinets, Unions, etc. Also Combers and other clean Cotton Wastes for Hosiery, Underwear, etc.

CHAS. W. BECKER, Agt.,
Amsterdam, N. Y.

Address Dept. 7.

M. B. SCHWAB, Pres. H. RAWITSER, Treas.
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RIVERDALE WOOLEN CO., MANUFACTURERS OF

.. Shoddies ..

Of every description. Capacity 7,000,000 pounds per annum. Custom Carbonizing and Garnetting a Speciality.

New York Office. 140 DUANE STREET. **RIVERDALE, NORTHBRIDGE, MASS.**

WILLIAM B. CHARLES,

Cotton and Cotton Wastes

Amsterdam, N. Y., U. S. A.

COTTON YARNS.

Contracts made with Cotton and Woolen Mills for Yearly Waste Production. Correspondence solicited. Shepperson's Code, 1878. Cable Address "Charles."

SHODDY

WM. H. H. SLACK & BRO.,
Springfield, Vt.

Carbonized Stock a Specialty.

FLOCKS

White hood stock	20-21
Clear hoods	9-10
Red stockings	9-10
Blue stockings	7-8
Fancy stockings, No. 1	7-9
Gray stockings	9-10
Black stockings	9-10
Knit stock comforters	6-7½
Red knit	9-10
Light gray knit	9-10
New light fancies	16-18
New fancies	12-14

Merinos.

Light, fine	13½-15
Light, coarse	7½-8
Fine, dark	12-13
Dark, No. 2	8-9
Coarse dark	5-6
Blue	12-13
Blue-seamed	13-14
Black—unseamed	12-13
New black	18-20
Small	3¼-4
Bunting	6-8

FLOCKS.

Shear, fine white, all wool	9-11
Fine indigo blue, all wool	9-9½
Fine black, and blue, all wool	7-8
Fine dark, all wool	5-6
Gig, fine, all wool	3-4
No. 1, black, all wool cut	6-7
All wool, fancy, shear and gig	2½-3½

COTTON WASTE.

No. 1 Spinners	9¾-10¼
No. 1 Machine	7-7½
No. 2 Machine	5½-6¼
Machine Cop	8-8¼
No. 1 Cop	9-9½
No. 1 Card	9½-10
No. 2 Card	8¾-9
No. 1 Oily Card	5-5½
No. 2 Oily Card	4-4½
Egyptian Card	Limited quantity
Peeler Combing	10¼-10¾
Egyptian Combing	Limited quantity
No. 1 Linters	5¾-6¼
No. 2 Linters	5-5½
White Clips	8-8½
Colored Clips	5-6
No. 1 Picker	2-3½

NOILS.

Australian	48-50
Fine domestic	38-40
½ Blood	24-28
⅜ Blood	22-23
¼ Blood	17-19
Braid	21-22
Carpet (white)	14-18
Carpet (colored)	10-12½

Seedy.

½ Blood	35-37
⅜ Blood	27-30
¼ Blood	23-26

Oregon, Pendleton. The Pendleton Woolen Mills have been closed until September 1st. The machinery will be thoroughly overhauled during idleness.

Vermont, Ludlow. The Black River Mill and the Ludlow Woolen Mill will close on the 30th for two weeks. The dam is to be repaired and other changes made.

*New Jersey, Somerville. An order has been granted by the court for removing James L. Griggs as assignee of the Somerville Woolen Co. and Larue Vredenburg of Somerville has been appointed receiver. The mills have been closed down. The Vice Chancellor in granting the decision states that he believes the concern to be insolvent and that the affairs should be settled under the direction of the court.

KNITTERS.

Knitter. Worked on light and heavy weight ladies' ribbed vests and shaped vests, and all kinds of common knit goods. Familiar with Champion, Nye & Tredick, Star, McMichael & Wildman machines. Wants work in Pennsylvania. 3037, Textile World Record.

Boss knitter, sewing machine fixer. Age 28; American. All classes of ladies' and children's knit underwear made on circular latch needle machines. Wants place at once. 3102, Textile World Record.

Knitter. Worked on light and heavy weight ladies' ribbed vests and shaped vests, and all kinds of common knit goods. Familiar with Champion, Nye & Tredick, Star, McMichael & Wildman machines. Wants work in Pennsylvania or Western States. 3037, Textile World Record.

Superintendent knitting mill. Cotton and wool hosiery, heavy mittens, sweaters, toques. Good experience. Aged 45; married. 1291, Textile World Record.

Superintendent Hosiery Mill. Age 22; American; single. Worked on 84 needle goods. Prefers position in the South. 3033, Textile World Record.

Boss Knitter or second hand. Silk, worsted, lisle, cotton and mixed yarns. Is familiar with any latch needle machine. 1819, Textile World Record.

General Manager or superintendent of ribbed underwear mill. American; married. Been in underwear business eleven years as superintendent and manager. First-class references as to character and ability. 3100, Textile World Record.

Latch Needle Knitter on N. & T., S. & H., S. & W., McM. & W., Pepper, Lewis Jones, etc., circular machines. Twelve years' experience as boss knitter and superintendent. Wants steady work. Sober, good manager of help, best of references. 3106, Textile World Record.

Boss Knitter or fixer. Would like to work with boss finisher on sewing machines. American; age 32. Familiar with McMichael & Wildman, Nye & Tredick, Snyder & Fisher, Scott & Williams and other makes of latch needle machines, Tompkins spring needle machines, and understands winding. 3118, Textile World Record.

Overseer Boarding and finishing hosiery. All kinds of men's, women's and children's hosiery, except silk. Age 41; American; married. Can furnish references. 3035, Textile World Record.

Superintendent of knitting mill, or foreman in large plant, is open to position. Had some 15 years' experience as machinist, foreman and superintendent. Familiar with all grades seamless hosiery and most makes of seamless hosiery machinery. Understands business from starting new mills to finish. Perfectly sober and reliable. 3078, Textile World Record.

Position wanted in charge of boarding, pressing, pairing, folding of hosiery, etc. First-class references. 3105, Textile World Record.

Superintendent of a 200 dozen hosiery or assistant of large hosiery. Thoroughly understands the technical and practical parts of machinery and manufacture. Young man. Fine references. 3137, Textile World Record.

Boss Knitter or Sewing Machine Fixer. German; married. Familiar with all makes of knitting and finishing machines on ladies' underwear. Will not go South or to Canada. 3128, Textile World Record.

Superintendent, or Partnership. Wants Western States, Canada, or Pennsylvania. Familiar with nearly all makes of circular hosiery machines. An American; married. 3131, Textile World Record.

Knitting Fixer. A young man; American. Ribbed and seamless hosiery, cotton, lisle and Egyptian yarns. Familiar with McMichael & Wildman ribbers, Paxton & O'Neill and Branson 3/4 automatic and Hepworth loopers. Will not go South. 3130, Textile World Record.

Asst. Superintendent or Boss Knitter. Age 29, strictly temperate and held position of boss knitter for past four years running. Fleeces, balbriggan and flat work on spring needles, and plaited, straight and shaped work on several makes of latch needles. Can give best of references. 1492, Textile World Record.

DESIGNERS.

Designer or Asst. Age 28; unmarried. Men's wear, woolens and worsteds. Prefers New England States. Thoroughly posted technically in all points, good on colors, calculations, etc. 3099, Textile World Record.

Designer. A young man who has had eight years of practical experience in cotton designing wants position as designer or boss weaver. Worked on Marseilles, crochet and satin bed spreads, table covers, ginghams of all kinds, including leno, lappet and all classes of the above. Jacquard work a specialty. 3107, Textile World Record.

Designer. Plain satin, fancy leno, checks, colored and dainties in cotton. Wants $3.50 or over a day. 3043, Textile World Record.

Designer, or assistant superintendent and designer. An A1 color designer. Can get up good line of fancy woolen and worsted goods which will be good sellers and profitable to the manufacturer. Graduate of a prominent designing and textile school in Germany. Is well posted on all kinds of stock, cotton and shoddy, and with the general work of a woolen mill. 1789, Textile World Record.

Asst. Superintendent or Designer. Familiar with men's wear, overcoatings and fancy worsteds. A young man. Taken post graduate course at Yorkshire College, Leeds, England. Attended Philadelphia Textile School a year and graduated from Lowell Textile School. Bright and of good character and habits. 3096, Textile World Record.

Designer or assistant. Worked on woolen and worsteds, cotton worsteds and mercerized goods. Good experience. A young man, single, Swede. 3127, Textile World Record.

MISCELLANEOUS.

Asst. Superintendent of dyeing, printing and finishing plant. Experienced in cotton and silk and capable of turning out finished product. American; 27 and married. Best of references. 3136, Textile World Record.

Second Boss or in advisory capacity for jacquard weaving. Familiar with almost every line of silk fabrics, also cotton backs, tapestry and upholstery goods, hammocks, table and bed covers, ribbons, etc. 3135, Textile World Record.

Fixer of sewing machines. Is familiar with machinery of all kinds that is used in making up and finishing knit underwear. Will not go West or South. Wants place at once. References. 3068, Textile World Record.

Boss Bleacher. Bags, shades, lawns, mercerized, Hollands, book cloth and table cloth. Prefers New York, New Jersey or Pennsylvania. 3083, Textile World Record.

Machinist. French; married. Has had full charge of all kinds of repairing. Understands all about boilers, engines, motors and can give best of references. 3090, Textile World Record.

Traveling position with mill supply house. Has been dyer, but mill now closed. 3103, Textile World Record.

Overseer or second hand's position. Understands twisting, warping, spooling and cone winding. Worked on all kinds of cotton yarns. Will not go West or South. 3112, Textile World Record.

Machinist on Leighton circular machines. Worked on sweaters and jacket. 2026, Textile World Record.

Master Mechanic in cotton mill. Wants $1,500 to $2,500 per year, according to duties and position. Can take place at once. Will not go to Western States or Canada. Familiar with steam engines, pumps, boilers, water wheels and complete cotton mill equipment. 3039, Textile World Record.

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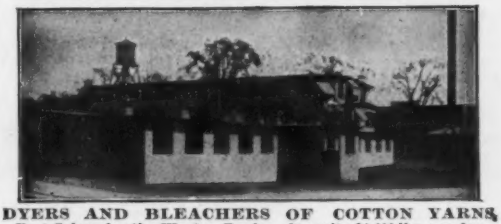

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HEMOLIN PATENTS SUSTAINED.

Judge Coxe, in the Circuit Court of the United States for the Southern District of New York, on July 19th handed down a decision in the case of HEMOLIN COMPANY versus HARWAY DYEWOOD AND EXTRACT COMPANY and FRED'K G. PAULAY, which was begun about four years ago by WM. J. MATHESON & CO., LTD., as assignees of patent No. 491,972, granted to PETER T. AUSTEN, for improvement in the art of making coloring matter from LOGWOOD. This product was named "**HEMOLIN**" the trade-marked name by which it has become known to the users of dyestuffs throughout the world.

No other dyestuff has been more widely imitated or pirated upon than "**HEMOLIN,**" and as this suit was regarded as a test case of great importance to the manufacturers handling these imitations and infringements, no effort was spared to invalidate the patents by the defendants and others in sympathy with them in this proceeding.

The decision of Judge Coxe, however, completely sustains the AUSTEN patents, and effectually disposes of every contention raised by the defendants. In referring to the latter, the decision says

"The defenses are lack of novelty and invention, and non-infringement.

"It should be remembered that the essence of the invention is that when Logwood Extracts are treated with Nitrite of Soda or Potash, under such conditions as to bring about a reaction between them, a new product, consisting of a permanent dry powder, soluble in cold water and rapidly soluble in hot water, is produced in which the gummy matters are expelled or rendered nonhydroscopic.

"The objections to the coloring matter extracted from Logwood, which was in use previous to the patent, are set out at length in the description and, so far as the proof shows, are stated with substantial accuracy.

"The Court is unable to find from the present record that any one before Austen made the new coloring matter covered by the third claim or used the method of producing it covered by the first and second claims."

After reviewing and pointing out the inconsistencies of the testimony introduced for the purpose of showing that an article practically identical with "HEMOLIN" had been produced prior to its discovery by Dr. Austen, the court takes up the references to patents and literature which were brought into the case for the same purpose, and says:

"The defendants' expert witness was asked to point out in any of these documents a suggestion of the use of nitrite of soda in the presence of water for modifying the resinous and other extractive matters in a logwood extract, in addition to such effect as may occur upon the haematoxylin, and he answered as follows:

"I cannot point out where it is especially mentioned that the use of nitrite of soda in the presence of water will modify the resinous and other extractive matters in the logwood ... I may mention in this respect the Avery patent, and this is absolutely the only piece of literature I can point out in this connection.

"It will not be necessary, therefore, to examine the other patents and publications.

"The Avery patent, No. 320,526, was granted June 23, 1885, for 'improvements in the preparation of liquors or extracts of logwood.'

"The patent is not for a dry extract, but for a liquor used directly in the dyeing bath. If Avery knew of the Austen invention and was endeavoring to impart that information to the public his use of language was most unfortunate. It is thought that no chemist, however skillful, would be able to practice the Austen invention after reading the Avery patent.

"The defendants are charged with infringement in the manufacture and sale of powders.

"The defendants' brief admits that 'defendants' powder agrees with claim 3 of the patent . . . and many of the powders described in the prior art, in the well known characteristics of being a friable solid, soluble in cold and rapidly soluble in hot water, and that it is derived from logwood extract. It is not, however, derived by the incorporation with the extract of an alkaline nitrite, although the nitrite of soda was used at one stage of the process.'

"The defendants' contention seems to be that they escape infringement because the extract treated by them with nitrite is not ordinary, but clarified, not a liquid but a paste, because it is cured or fermented and by the previous addition of other ingredients its character has been substantially changed. In other words, they use the patented process, but add to and improve upon it. This is, in fact, admitted by the president of the defendant company, who was called as a witness by the complainant."

In conclusion, after reviewing at length the testimony of this witness, the court says:

"Further discussion is unnecessary. Infringement seems clear and if the defendants can prove to the contrary, they should do so. The mere assertion that their process is not that of the patent, without stating what their process is, does not meet the issue.

"The complainant is entitled to the usual decree."

The testimony presented by the complainant, as well as by the defendants, clearly showed that "**HEMOLIN**" as a dyestuff is superior to any other preparation of Logwood, and that any Logwood product approaching "**HEMOLIN**" in those characteristics which make it superior to ordinary powdered extracts must be an infringement of the Austen patents.

The buyers of dry extracts of logwood under any name, are warned accordingly.

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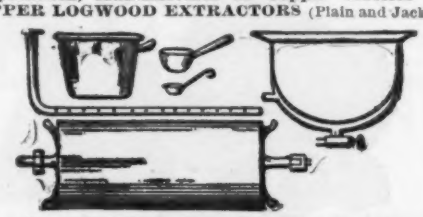

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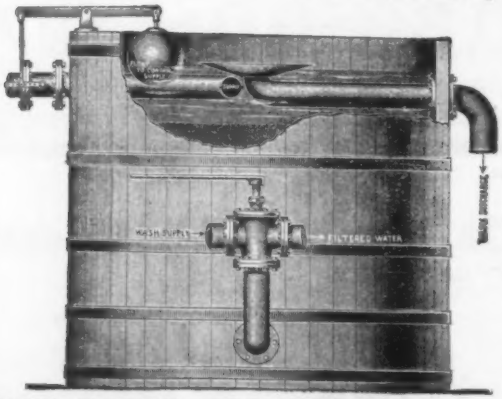

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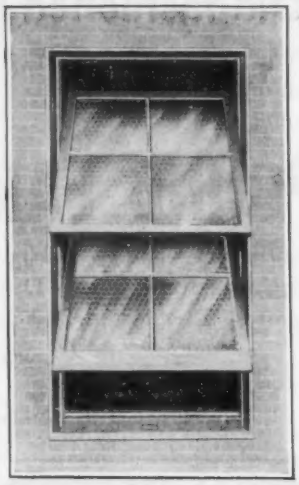

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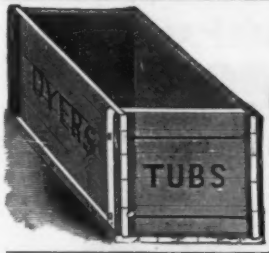

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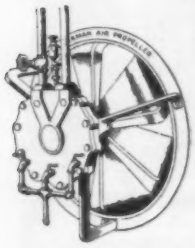

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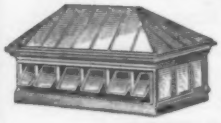

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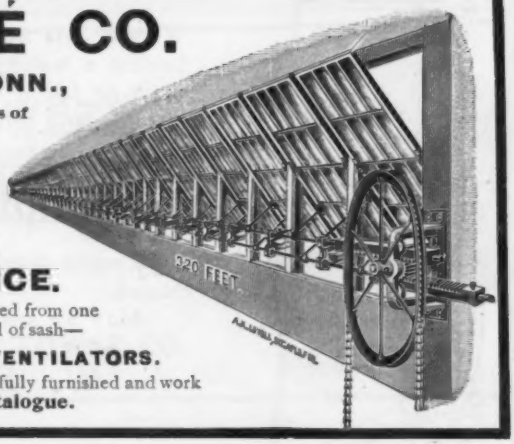

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SKYLIGHTS, CORNICES, VENTILATORS.

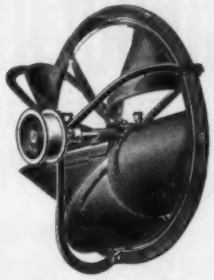
Correspondence solicited. Estimates cheerfully furnished and work guaranteed. **Send for Catalogue.**

THE BERRY SYSTEM OF DRYING

Applied to Cloth, Wool, Cotton, Drying Rooms, Tables or Machines makes a guaranteed increase of 25 per cent.

We Improve CARBONIZERS Also.

This is the Berry Wheel, the most efficient agent for moving air, eliminating steam and other impurities in the atmosphere.



A. HUN BERRY,
23 West First Street,
BOSTON.

An Effective Label

well put on, wire costing one cent per 1000 stitches.

Complete Outfits of

Printers Machinery

Book Binders Machinery

Paper Box Makers Machinery

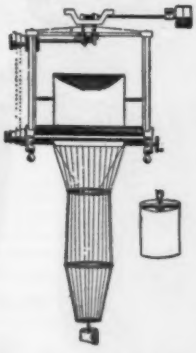
An extract from purchaser's letter:

Gentlemen:—
Since using your Brehmer Wire Stitching Machine, we have impressed on each garment over 2000 dozen at a cost of only 40c. outside the price of machine. Whereas the same amount of pin-fastners would have cost us $33.50.

STAR KNITTING CO., Cohoes, N. Y.

Chas. Beck Paper Co., Ltd.,
609 CHESTNUT ST., PHILADELPHIA, PA.

The Johnston Patent Improved Vertical Dryer



IS an absolute improvement over any other Dryer made. Simplicity of operation. Superiority of construction and work done. Economy of labor, hot air and room. Suitable for either extra heavy or the thinnest make of goods.

Sole Owners and Manf'rs

The Johnston Novelty & Mill Specialty Co.,
Utica, N. Y.

Send for circulars and prices.

LEWIS JONES,

60½ and Media Streets, . . . PHILADELPHIA.

GAS ENGINES for city or country
BRUSHING MACHINERY
KNITTING MACHINERY
} EFFICIENT DURABLE LOW IN PRICE

THE CYPRESS LUMBER CO.

TWO BIG FACTORIES.

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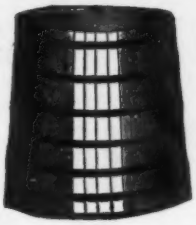
Boston, Mass.

Write Nearest



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Apalachicola, Florida.

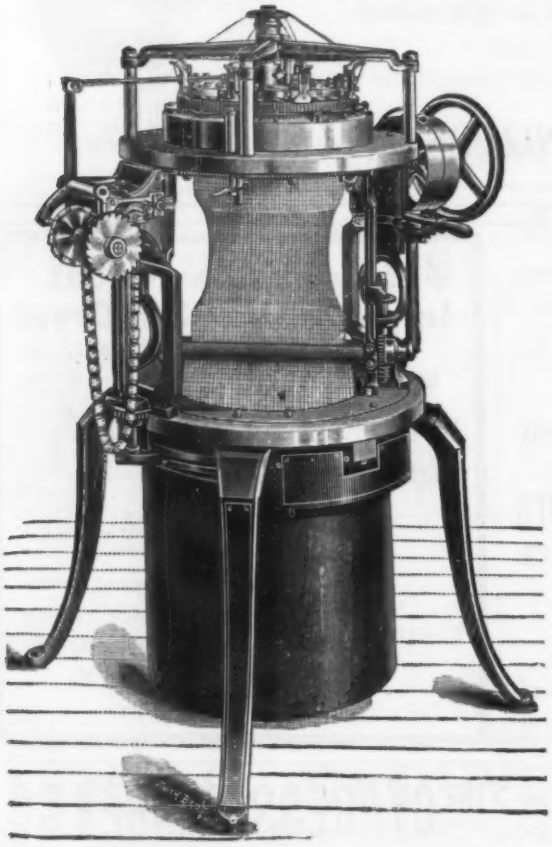
Write Nearest

McMICHAEL & WILDMAN MFG. CO.

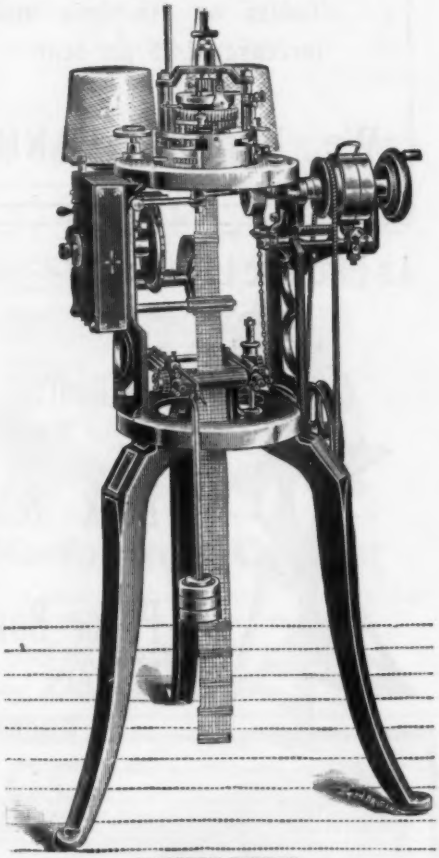
CIRCULAR RIB KNITTING MACHINERY

AUTOMATIC AND PLAIN

For all classes of Ribbed Hosiery and Underwear, Combination Suits, Sweaters, etc.



AUTOMATIC BODY MACHINE.



HOSIERY RIBBER.

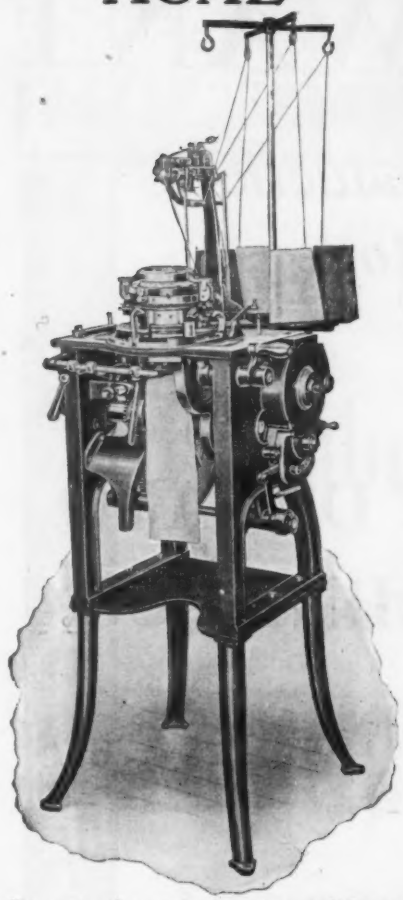
ESTABLISHED REPUTATION FOR LARGEST PRODUCTION, BEST QUALITY FABRIC, DURABILITY, ECONOMY OF OPERATION

Full Particulars, Description and Samples Furnished upon Application to the

McMICHAEL & WILDMAN MFG. CO.

NORRISTOWN, PENN.

ACME



The

Two Leaders

Fully Automatic Hosiery Knitters

For Making all Kinds and Gauges of Seamless Hosiery

HEMPHILL

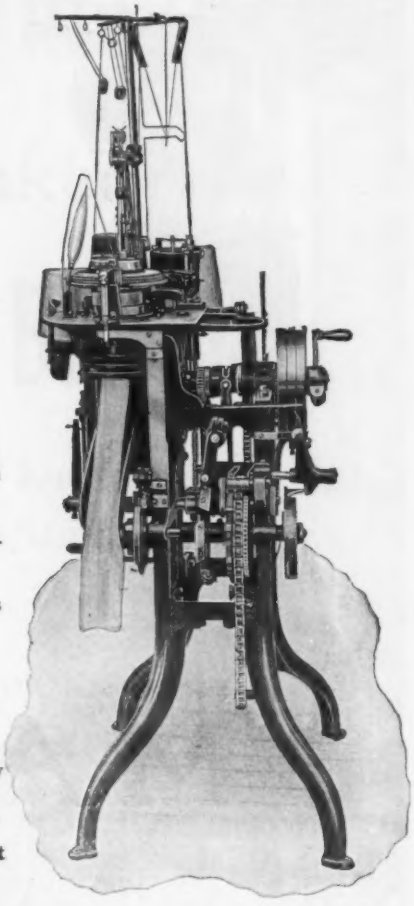
One with

GEARS

the other with

CHAIN

for pattern mechanism



To meet the various tastes of different manufacturers. Both used and approved by leading hosiery manufacturers.

Both contain all the well-known essentials demanded of first-class knitting machines.

With these two machines we can supply all the manufacturer's possible wants in the best possible manner.

Write us for further particulars and prices.

We also make all kinds of LATCH NEEDLES.

Many leading manufacturers use our needles and say they are the best on the market.

Send us a trial order.

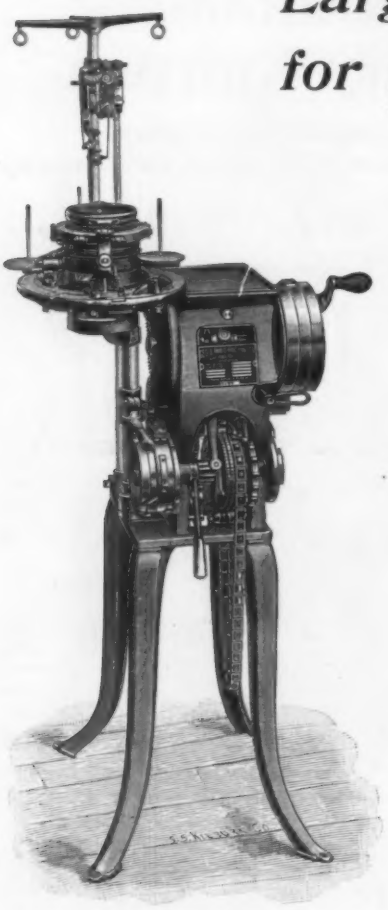
E. A. Newton, 245 Race Street, Philadelphia, Pa., agent for the "Hemphill."

This machine can be seen in operation at his office.

Mayo Knitting Machine & Needle Co., Franklin Falls, N. H.

Philadelphia Office: Knickerbocker Bldg., Cor. 6th and Arch Sts.

IF YOU WANT



Largest Production
for Least Money,

write

GEO. D. MAYO MACHINE CO.

LACONIA, N. H.

Latest,

Simplest,

Best.

MAYO'S

New Full Automatic Knitter.

The Old Reliable

Friedberger Mfg. Co.

Pioneer Makers

EDGINGS AND BRAIDS.

Unequalled Facilities for Prompt Deliveries of Any Quantity.

MILLS at GERMANTOWN, PHILA.

P. O. Address, Logan Station, Phila.

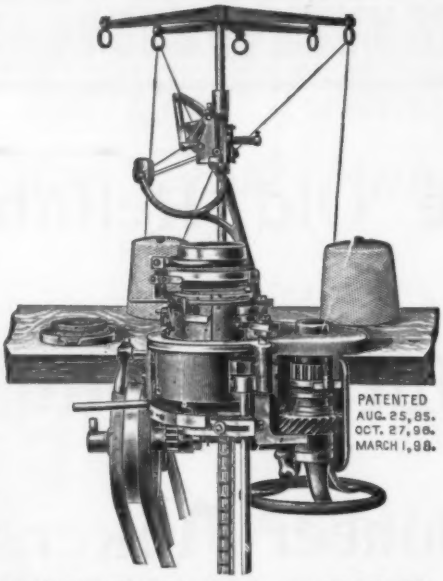
The "INVINCIBLE"

The "INVINCIBLE" is reasonable in price.

It's best advertisement—the recommendation of its users.

Its METHOD of TRANSFERRING is still the best.

Others try to imitate.



Full Automatic Knitting Machine

"The Knitter That Knits."

Leads Them All.

Write for Catalogue.

Philadelphia Office, ROOM 370 BOURSE.

E. JENCKES MFG. CO.

Factory and Main Office, PAWTUCKET, R. I.

The Merrow

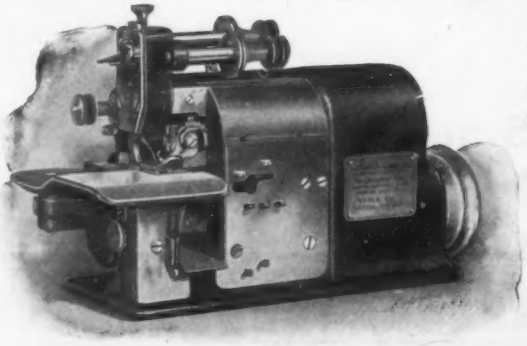
High Speed Overseaming, Overedging and Scallop Stitch Machines

are LIGHT RUNNING, FAST and DURABLE.

OUR NEW STYLE 60 MACHINE for Trimming and Overseaming in one Operation produces the strongest, best Seam and does it with the greatest economy.

STYLE 35 B SHELL MACHINE

For Necks and Fronts of Rib Goods, produces the most showy, substantial finish.



USE STYLE 17 or 22 for Bed Blankets and STYLE 18 for Horse Blankets.

Send for Catalogue and Samples.

THE MERROW MACHINE CO.

Bourse Building, Phila. HARTFORD, CONN. 346 Broadway, New York

QUAKER CITY STOP MOTION COMPANY,

23D AND HAMILTON STS., PHILA., PA.

Makers of the Stop Motion that can be attached to **any knitting machine.**

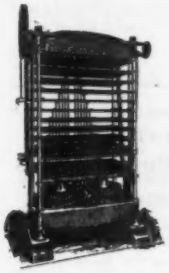
Makes more perfect work, reduces labor and waste.

SAVES MONEY.

This has been proven by actual demonstration.

For particulars address as above.

The CRAWFORD



HOLLOW STEAM

PLATE PRESS

For Knit or Woolen Goods.

The most reliable machine of the kind on the market.

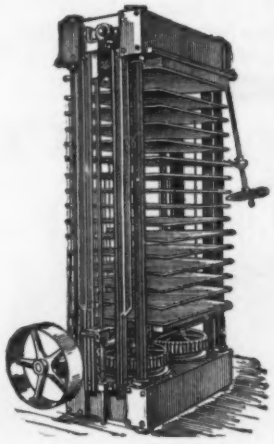
PRESS PAPERS and FENDERS.

SPENCE & RIDEOUT,

Successors to
J. J. CRAWFORD & SON,

NASHUA, N. H.

Established 1868.



Reliance Hot Plate Press

For Hosiery and Underwear Trade.

For price and particulars address

CHARLES HART

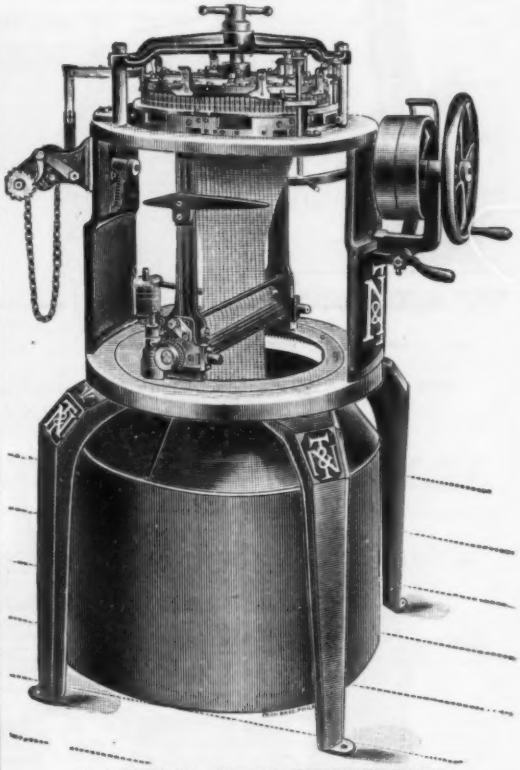
Hedge and Brown Sts.,
Frankford, Phila., Pa.

NYE & TREDICK CO.

Circular Rib Knitting MACHINERY

For making Ribbed Underwear, Combination Suits, Sweaters, Cuffs, Shirt Borders, Hosiery, etc. : ; :

Correct Construction. Excellence and Durability.



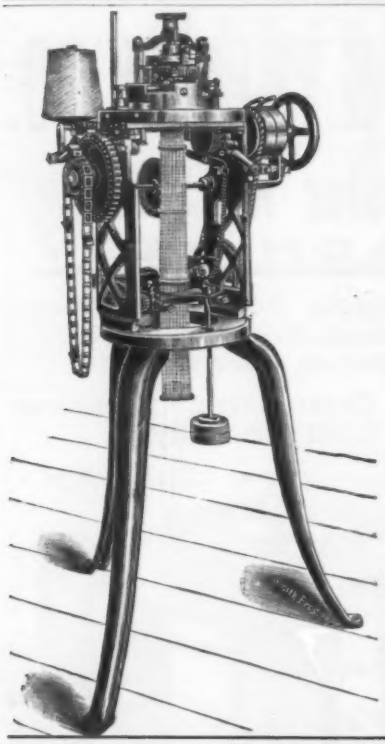
LATEST IMPROVEMENTS

QUALITY OF FABRICS AND PRODUCTION

UNEXCELLED

NYE & TREDICK CO.

606 Arch St., PHILADELPHIA, PA.



H. Brinton & Co.

213-215 Race Street, Philadelphia, Pa.

BUILDERS OF

Knitting Machinery

For HOSIERY and UNDERWEAR.

Complete Estimates Furnished. Send for Particulars.

The cut shows our **Improved Automatic Ribber** with Welt and Slack Course for Half Hose, Tops and Ribbed Legs.

WALTER SCHOEBEL, Springfield Ave. and 7th St., **Newark, N. J.**

Sole Agent for the U. S. for

Jaquard and Burl-machine

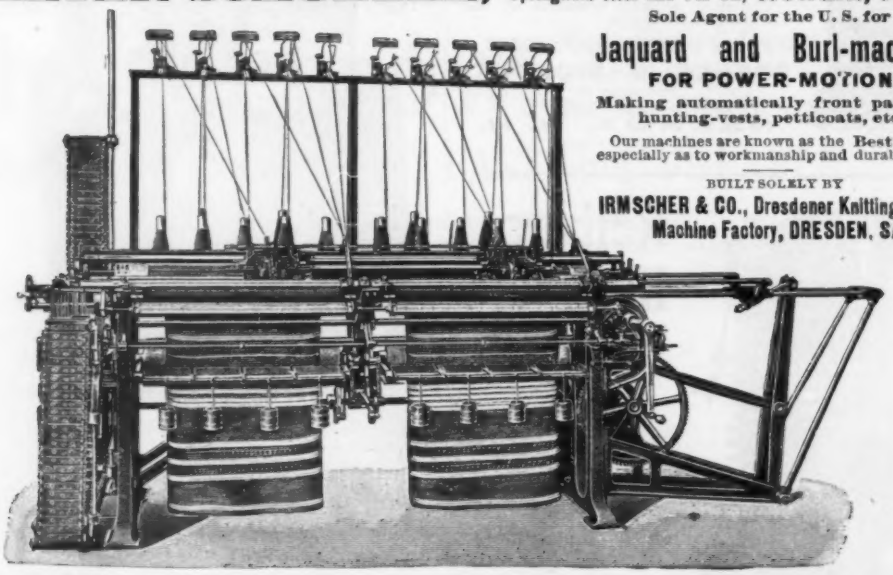
FOR POWER-MOTION

Making automatically front parts of hunting-vests, petticoats, etc.

Our machines are known as the **Best Built** especially as to workmanship and durability.

BUILT SOLELY BY

IRMSCHER & CO., Dresdener Knitting Machine Factory, DRESDEN, SAXONY



SWEATERS.—This machine is built with 1 or two sections which work together (dependently of each other) and produces all patterns which could be made hitherto on Hand-Jaquard- and Burl-machines automatically in endless pieces with dividing thread. We are ready to wait on with collection of same which will be the best recommendation, and here we will mention but to following advantage of this machine which is constructed very geniously: It is provided with autom. racking-apparatus as far as 6 needles, special cams for double rib, autom. change of all middle and wing-cams, 2 thread-carriers, autom. change of colors, special attachment for locking in the loops and electric stop-motion in case of yarn-breaking, knots, etc.

All these apparatus are set to work by the pattern-chain, consisting of a number of Jaquard-cards. This new arrangement which is our invention enables the knitter to put together any pattern, making the necessary cards by means of a stamp and after a table we subjoin.

Special Hand and Power Machinery for Fancy Gloves, Sweaters, Golf Hose, Ladies' Blouses, Etc.

CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete, for

Ribbed Underwear, Sweaters, Cardigans, Cuffs and Anklets.

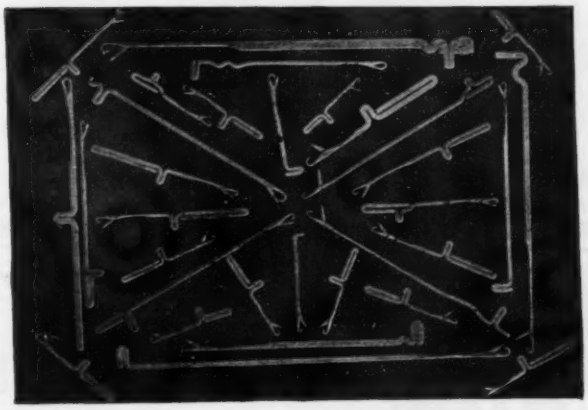
The Leighton Circular Machines are the only ones which **Rack** or **Shog** the needles for fancy borders; also built for automatic striping; and with from 4 to 16 feeds for underwear.

Also Builders of ABEL WINDERS, SEAMERS and LOOPERS.

LEIGHTON MACHINE CO.,
Manchester, N. H.

Latch Needles

For all Knitting Machines.



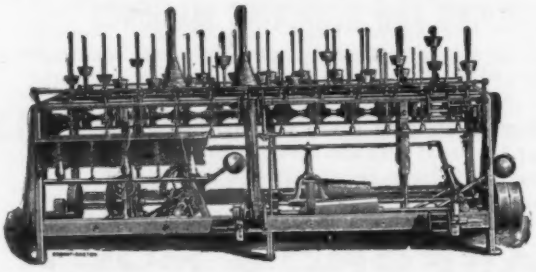
Our Superior or Sunken Rivet Head Needles

Will save you money every day in the year.

Dodge Needle Co., Manchester, N.H.

We now build, with or without differential motion, for winding on Bobbins from Skein or Cop,

THE ABEL WINDERS



ALSO THE

Abel Seamers and Loopers

IN CONNECTION WITH OUR LINE OF

AUTOMATIC RIB KNITTING MACHINERY.

LEIGHTON MACHINE CO., Manchester, N. H.

JAMES TAYLOR,

835 Arch Street, - - - Philadelphia, Penn.

KNITTING MACHINERY

OF ALL KINDS. NEW AND SECOND HAND.

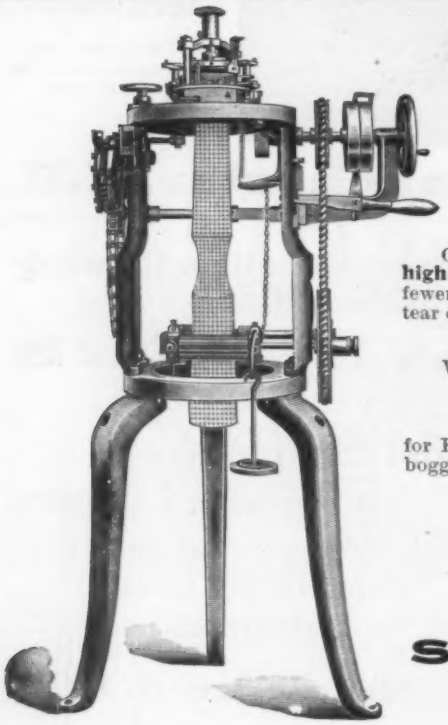
A RARE OPPORTUNITY TO BUY.

50 New Victors, various sizes.
28 Beattie & Hepworth loopers.
1 Corneley embroidery machine.
10 Hosiery presses (lever).
1 Hydraulic 12-plate press.
3 Hemphill machines, 3¾ inch, 160 needles.
150 Ribbed underwear machines, various sizes and makes.
1 Speed lathe. 1 Sensitive drill.
60 Brinton & Co. ¾ aut. knitters, sizes.
27 Standard A machines.
56 Union Special machines, various styles.
1 Singeing machine.
2 No. 50 Merrow machines.
15 Mayo machines.
100 Brooks welters.
4 Jones' fleecing machines.
98 Brinton & Co. and other make hosiery ribbers.
6 Invincible machines, 176 needles, almost new.
1 Wayburn fabric cutter.
40 Ribbed shirt machine cylinders and dials, all sizes, cuts and makes.
1 24 spindle Payne Skein winder
50 National spring needle machines.
1 Sandusky mangle, 60-inch.
1 26-inch belt driven extractor.
4 Old style Jackson winders.
2 Lindsay & Hyde winders.
2 No. 35 Merrow small shell machines.
1 Industrial over-seamer.
3 Typewriters.
2 Cyclone hosiery dryers.
5 Band folding and cutting machines.
1 48 spindle Payne Cop winder.
1 Hemphill Rib-cutter.
15 Standard B. machines, 200 needles.

WRITE FOR COMPLETE LIST.

APPRAISEMENTS A SPECIALTY.

We are always in the market to buy good second-hand Knitting and Finishing Machinery.



High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at **very high speed**, giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

STRIPING AND DESIGNING MACHINES

for Fancy Golf Stockings, Bathing Suits, Sweaters, Toques, Toboggan Caps, Skirts, etc.

Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

STAFFORD & HOLT,

LITTLE FALLS, N. Y.

"The best is cheapest."

The Knitting Machines Made by

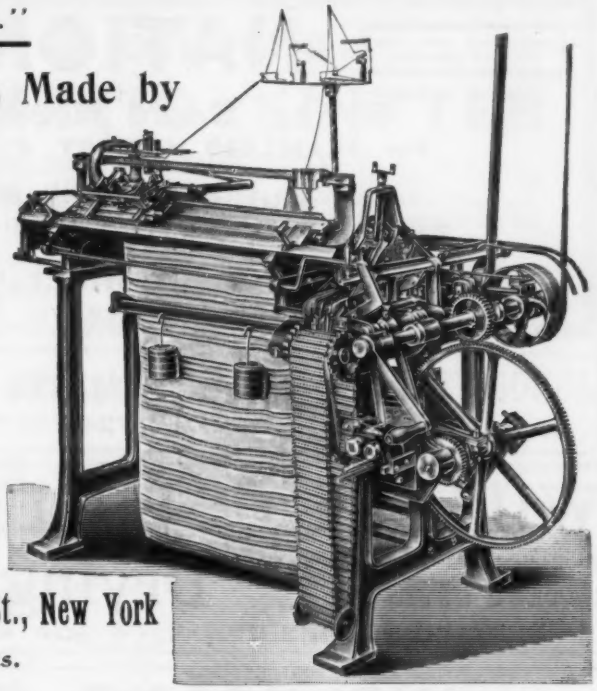
WILHELM BACH,

Apolda, Germany

are made of the highest grade tool steel, best constructed, and more durable than any other machines on the market for

Knitting Fancy Vests, Sweaters, Golf Jackets, etc.

Fully Automatic Power Machines a Specialty.



D. Rheinauer & Co., 136 Greene St., New York

American Selling Agents.

CHARLES COOPER,

BENNINGTON, VERMONT.

MANUFACTURER OF

Knitting Machinery

Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder. **Spring Needle Cylinder Rib-Top Machines**, for making Cuffs, Drawer Bottoms and Shirt Borders. **Spring and Latch Knitting Needles, Burr Wheels, Burr Blades, Sinkers, Jacks, etc.**

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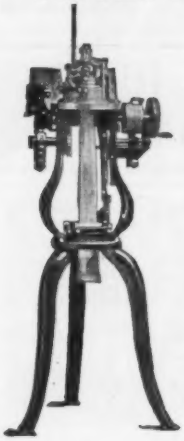
CRANE MFG. CO.

SUCCESSORS TO

PEPPER MACHINE WORKS

Lakeport, N. H.

Manufacturers of



Knitting Machinery,

INCLUDING

Pepper's Flat Ribbed Cuff Machines,

Automatic Welt and Loose Course Machines for Stock Tops. New Circular Stripers with Welt, Loose Course and Striping (Automatic), for Short Cuffs, Sock Tops, Hose Legs, Wristers, etc.

Golf and Bicycle Stocking Machines,

ALL KINDS OF

CIRCULAR RIBBED MACHINES

For Men's Underwear, Ladies' and Misses' Hose Legs and Leggins.

Correspondence Solicited.

SMALL RIB MACHINES
CROCHET MACHINES

NATIONAL

SHELL STITCH
MACHINES

Spring Beard Needle Machine
For SEAMLESS HOSIERY, Plain and Novelties

Automatic Rib Machine
For RIBBED UNDERWEAR. All Styles and Gauges

Over Seam Machine "Champion, Improved"
For Welting Seamless Hosiery. Covering Raw Edges of Rib Fabrics.

NATIONAL AUTOMATIC KNITTER CO.
SEND FOR FULL PARTICULARS
724-726-728 Cherry St., Philadelphia

WILLIAM C. BULL, BENNINGTON, VERMONT.

For Ladies', Gents', and Children's Goods.
LATEST STYLES.
BEST WORKMANSHIP.

MAKER OF
Drying Form Boards
OF EVERY VARIETY.

WOLFGANG RICHTER,
Importer and Builder of
Full Fashioned Knitting Machinery
N. E. Corner Third and Green Streets,
PHILADELPHIA, PA.

Perfect Fast Black for Hosiery That Will Not Tender the Goods

Manufactured by A. N. DUBOIS, Inventor and Patentee. Works: N. W. Front St. and Lehigh Ave.
Private Office: 2170 Sedgely Avenue, Philadelphia, Pa.

I offer the trade the following specialties that I manufacture exclusively for the FAST BLACK DYERS UPON COTTON HOSIERY:

FIRST:—My **Latest Improved Sanitary Fast Black in Liquid Form** ready for instant use. This Black is so compounded that it will stand the highest degree of heat of the Summer without in the least tendering the goods after they have been given the lisleing finish and let off in the ageing room. This black will oxidize and lisle quickly and permit the filling of the oxidizing rooms three times in 24 hours on the lisle finish when room is of good size, and not less than two times in 18 to 20 hours in boxed-in machine.

SECOND:—My **New Compound Liquid Trichromate,** far better than the Bichromate now used by all fast black dyers. With this new product the fast black dyers can make their black ungreenable if they so desire, because it is much richer in chromium and oxygen than the Bichromate, as can be seen by their chemical formulæ, which is for the Bichromate Cr_2O_7 and for the Trichromate Cr_3O_{10}, or one more chromium and three oxygen, which make it one-third stronger than the Bichromate. This oxygen acting upon the green oxidized aniline, makes it ungreenable, which can not be done with the Bichromate. But most important is the fact that no steam is required, as it acts well with cold water, which saves coal and makes the dye house comfortable.

THIRD:—My **Compound Fast Black Fastener and Brightener,** to be used either with the Trichromate or the ordinary Bichromate, also in the cold, and which will give a lustre to the goods never before obtained by Bichromate. It is put in the chrome bath, and its action is such that the goods get ungreenable and lustry; indeed, the lustre is such that Egyptian yarn knitted hosiery looks almost as bright as though mercerized yarn was used. Fast Black Dyers will find it an invaluable chemical with which they can produce either shade of black they desire and give their customers a black that will not turn green to acid muriatic test.

FOURTH:—My **Diamond Softener,** already put up for instant use. This softener is better than any soap or olive oil softener made or any other similar compounds. It is the result of my 24 years' experience in fast black dyeing. It never will stain the boxes or bands of hosiery, it has a pleasant odor and gives a nice finish. It agrees well with any colors as well as fast black.

With the above four compounds the proprietors of fast black dye works or hosiery doing their own dyeing are sure to get good results always, and will not depend upon unskillful boss fast black dyers. The boss dyer will find it very convenient to have his dye and finishing compounds already made up for instant use.

In offering the trade my Latest Improved Sanitary Fast Black Dye in Liquid Form, I mean to allow the use of my Letters Patent, No. 723,147 for the Lisle Thread Finish free of any royalty, and will give also free of charge all instruction necessary for the dyeing and finishing process, and so long as one uses the fast black dye, he will be permitted the use of the Lisle Thread Finish Letter Patent free; this privilege, however, to cease when applied to other fast black dyes.

Besides the above specialties, I retain my former business of starting up mills in fast black and colors dyeing and bleaching, and contracting for complete equipment with or without the dye formula.

PAXTON & O'NEILL'S

3-4 AUTOMATIC KNITTER

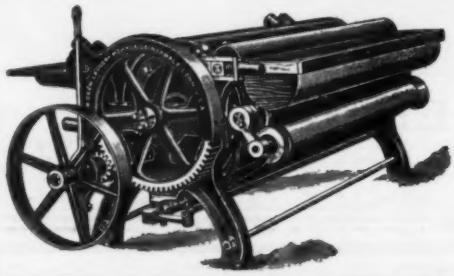
FOR ALL KINDS AND GUAGES OF SEAMLESS HOSIERY.

Has the preference wherever used over 7-8 and full automatics. Because it makes as much or more goods and better goods. Costs less for repairs. Gives less trouble to fixers. Range on Half Hose, from the coarsest to 260 needle.

Exclusive rights to BROWN'S ATTACHMENTS FOR LACE EFFECT.

Cylinders and Dials for all size Machines. **127 Bread Street, Phila.**

AUTOMATIC IRONING and PRESSING MACHINE for KNIT GOODS.



This machine irons and presses ribbed and flat underwear, giving a fine, smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

J. W. CRAW LAUNDRY MACHINERY CO.,
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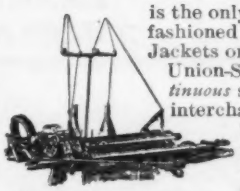

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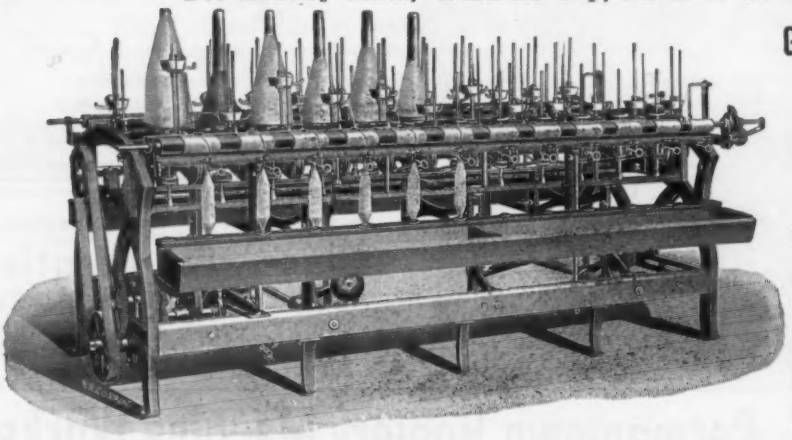
For Hosiery Mfrs., Wind for Cop, Skein or Bobbin.



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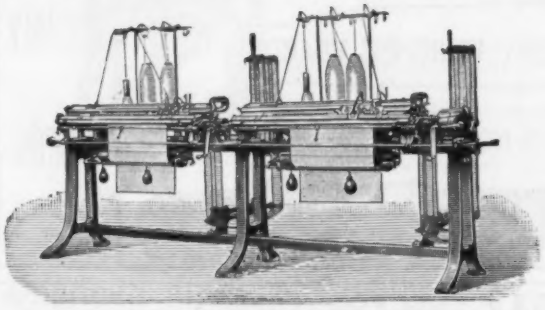

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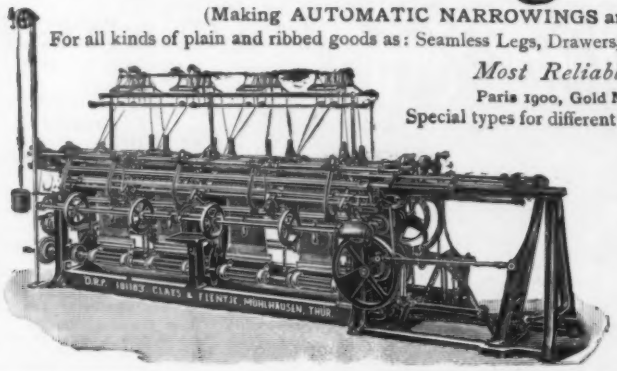

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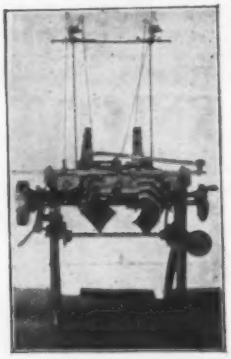

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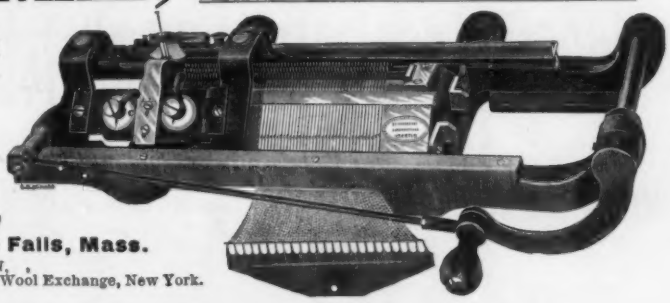

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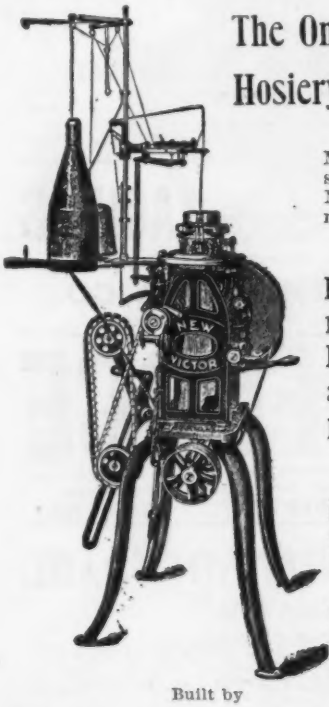

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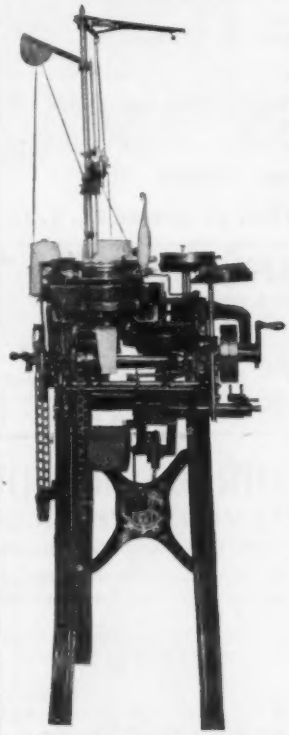

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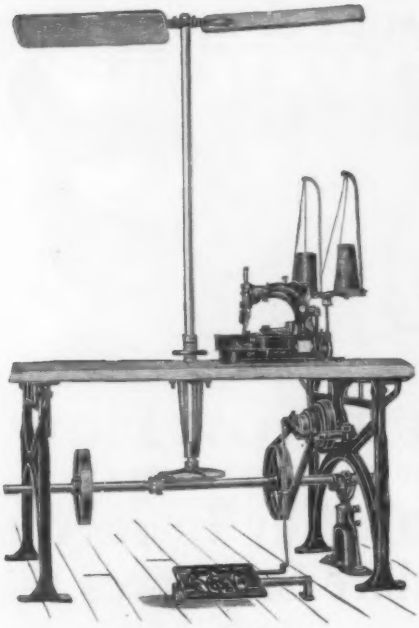

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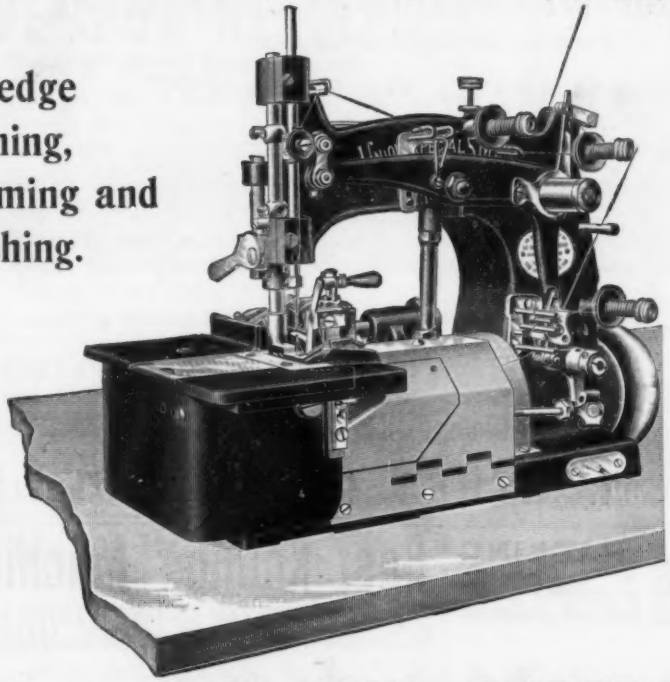

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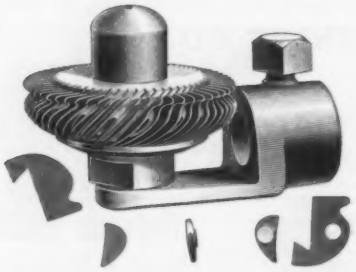

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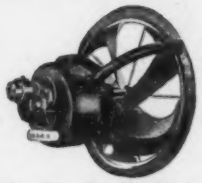

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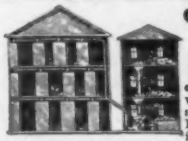

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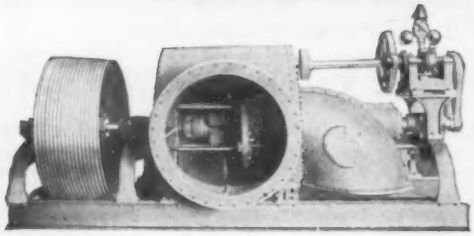

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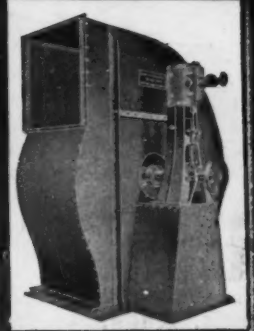

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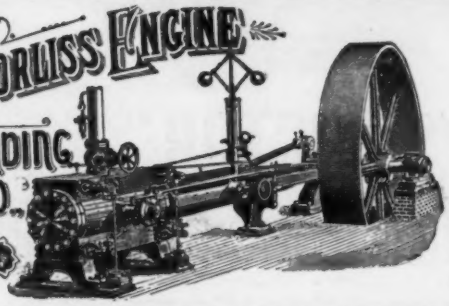

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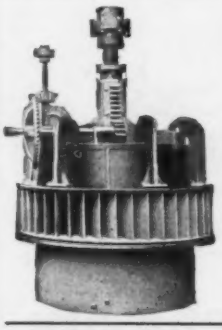
It has NO EQUAL for Close Regulation and Noiseless Operation. Send for Catalogue.



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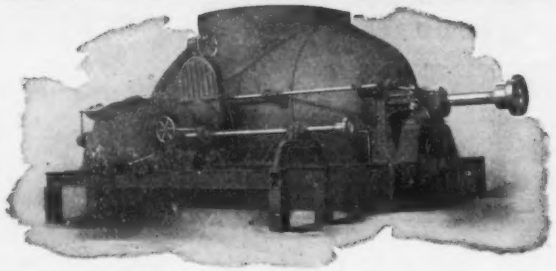

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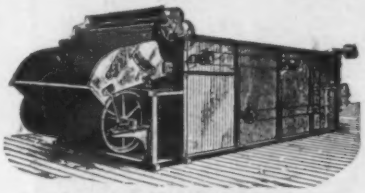
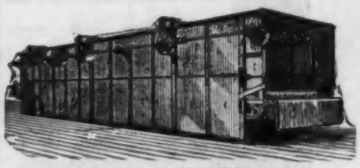
Boston Office, 176 Federal Street.

AUG 13 1904



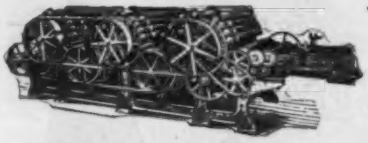
Automatic Cotton Stock Dryer.



Automatic Yarn Dryer.

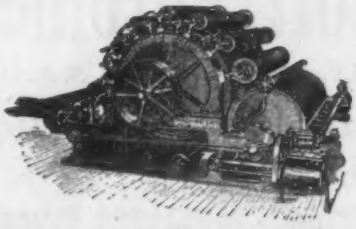
"CYCLONE" DRYERS

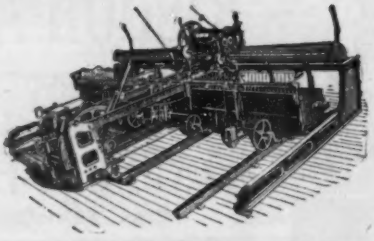
For Cotton Stock, Wool Stock, Rags,
Yarn, Cloth, Underwear, Stockings, Etc.



"PROCTOR"
Garnett Machines and Pickers

For reducing to fibre Cotton and Woolen
Waste, Cloth Clippings, Etc.





"FURBUSH" Woolen Mill Machinery

Including Pickers, Cards, Mules, Twisters,
Warpers, Dressers, Spoolers, Etc.

Manufactured by

THE PHILADELPHIA TEXTILE MACHINERY CO.,

Hancock and Somerset Sts., - PHILADELPHIA, PA.

Talks to Textile Manufacturers

CHAPTER VI

WOMEN WANT TO KNOW how to get good goods. I have proved this by actual investigations of the demand and distribution of several lines of textiles in ten leading department stores of New York and Chicago.

My investigations show that in every case the shopper uses whatever previous knowledge she has to get the goods that for any reason she considers reliable.

WHEN THEY DON'T KNOW the name of the goods they want, sales are lost for those goods. The salesgirl won't, or can't, supply her lack of information and "something else just as good" is substituted.

LET THEM KNOW about the goodness of your goods by forceful, emphatic, definite advertising which will tell them so plainly about your goods that they simply *must* ask for what they want.

THROUGH THE BUTTERICK TRIO you can teach Six Million Women to ask for your goods by name. They force the demand for your goods through retailer and jobber. The demand must come up the line to you from the consumer. Consumers Education × Demand on Retailer × Pressure on Jobber = Your Increased Output.

DEMAND is created by your educating, every month, at a cost so low no other method can touch it, *6,000,000 women.*

DISTRIBUTION is effected by these six million women asking for your goods by name, and getting them.

Advertising is only part of it. You must follow up the results of your advertising, bringing consumer and retailer together. When you do this the result is an order for your goods. Our TRADE AID SERVICE helps you in every detail of this necessary follow-up work. It stands by you to make a successful advertiser of you. We know what can and can't be done in advertising in the Butterick Trio. We don't take advertising until we believe we can make it a success. I will tell you how if you want to know.

The Woman's Herald for Men discusses a wide range of practical advertising and selling problems from the standpoint of actual experience and accurately ascertained results. Sent, *Free*, monthly, for the asking.

THOMAS BALMER, Advertising Manager

THE BUTTERICK TRIO

THE DELINEATOR—THE DESIGNER—NEW IDEA WOMAN'S MAGAZINE

Butterick Building, New York

JAMES SMITH WOOLEN MACHINERY CO.

411 to 421 Race Street, Philadelphia.

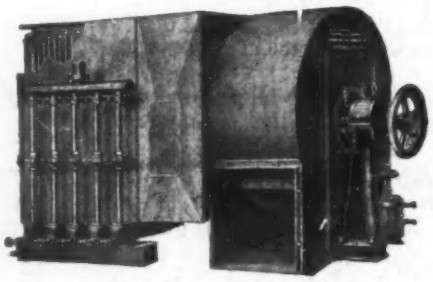
Woolen Machinery

FOR

Carding, Spinning, Wool Washing, Carnetting, Pickering, Drying, Burring, Cleaning, Finishing.

Cotton Batting and Waste Machinery.

FOR MORE COMPLETE LINE SEE PAGE 59.



Economical—Efficient—Reliable

THE BUFFALO FAN SYSTEM

Of Heating — Ventilating — Drying and Humidity Control

Used by America's Foremost Textile Mills. *Send for List*

Buffalo Forge Company

BUFFALO, N. Y.

NEW FOSTER CONE.

Open wind from start to finish of Cone.

No press-offs from knots, over-winds, etc.

The only perfect system of winding yarn for knitting purposes.

Over 30,000 spindles in use in the U. S.

FOSTER MACHINE CO.,

Westfield, Mass.

Walworth Manufacturing Co.,

HIGH PRESSURE

VALVES AND FITTINGS

"Walmanco" Pipe Flanges,

"Never Stick" Blow-off Cocks, Mill Supplies.

GENERAL OFFICES:

132 FEDERAL STREET, BOSTON, MASS.

New York Office: Park Row Building.